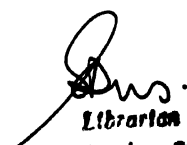


Journal of The Asiatic Society

1857


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JOURNAL

OF THE

ASIATIC SOCIETY.

Journal of a Mission from the Supreme Government of India to the Court of Siam —By DR. RICHARDSON ¹

January 22nd —Long-song-noi, 4h 50m, fifteen miles Left Fata-kan, and proceed in a south-west direction along the level towards the hills near the foot of which the path lies till 9h 35m when we ascend a rocky hill, and cross a small stream, pass a large Kareen village, which seems a permanent residence of a portion of that wandering tribe, their houses were large, their dress better, and the women were seated in the house more clean and neat in their person than usual, they were the first Kareens we had seen whose forefathers had been inhabitants of this part of the country. The village which was surrounded by high, abrupt rocky hills, consisted of seven or eight houses, with their betel vines and jack fruit trees close round the houses, from this we descend in a ravine till 11h 25m where we cross a second run of water, from this the country is more open (the valley of the May-nam-noi may be three miles across) and rocky, the trees small and stunted, with little or no foliage, affording no shade from the sun, the latter part of the march was excessively hot. At 12h. 15m we crossed the small dry bed of a stream forming the boundary between Tata-kan and Long-tsong, these towns, if they may be

¹ Continued from p 1036, VOL. VIII

dignified with the name, have only lately had any territory assigned them, as the province of Dayiek formerly reached from the Pon river, near Takanom, north, to a stream near Camboorie, and form the district of Dwong-ka-dhot, or Moimg-Ontai, east, to the three pagodas on the Tavoy frontier, west. At 12h 25m pass a third small stream of water, and at 1h. 20m halt here on the banks of another, in which the water is standing in small pools in the deepest parts of the bed, with an underground current through the sand. We are not more than two miles from Long-tsong stockade, but to allow the elephants to come up with day-light we were obliged to halt here. The path to-day has upon the whole been good for a hill country, and the water scarce, taking the same circumstance into consideration, but as this is the most precipitous side of the hills the larger portion of the water probably finds its way by the Tenasserim river into the Bay of Bengal. The number of Kareens who pay tribute through Camboorie, mentioned yesterday, is, as I suppose, exaggerated, Dayiek and Taung-ka-paung being the places, Mung-keik's (present chief of the Talines in Siam) father took up his abode on coming over from the Birmanians, though the largest number of that people dependant on them have only about 100 each, Tatakan has only thirty, and Pia-sao-one seventy, the average of these two would give fifty for the smaller towns, or a total of about 550. Nine Kareens and fifteen Talines are free from tax, as garrison, if I may call them so, of each of the frontier posts along the river, but they have in lieu to furnish guides and provisions to public officers passing through the country. The elephants came up at 6h. 10m. and it was dark before the tent was pitched.

January 23rd—4h. 10m, thirteen miles Start at 8 A. M., and at 8h 50m pass the road leading to Long-tsong, about a mile from the river on which that post is situated, from hence we had a cart road throughout the rest of the day, the jungle thin, the trees stunted and scanty of foliage, the country sterile or covered with strong rank grass, the sandstone work protruding through the surface at intervals, without other mark of cultivation or sign of inhabitants, except the good level cart road by which we travelled. 9h We pass the stream of Long-tsong with

a run of water ankle-deep, soon after which we saw the first sapan wood, the tree much resembling the Caouchouc tree in leaf and appearance, and seldom reaching here (the N W limits of its growth) a greater size than the thickest part of a man's arm. Our route lay occasionally near the eastern and occasionally near the western range of hills. At 11h. 45m. we pass another small stream (the May-ta-pan), in a sort of ravine, and at 12h 30m halt opposite Moun-g-tseing (Lion's town) a ruined stockade on the eastern or north-eastern side of the river. I find the Taline garrison in these stockades are more military than I supposed them, they are not employed in collecting the duties which are taken by the Kareens to Camboorie. The chief of Moun-g-tseing receives sixty tickels a year from the king, and fifty men are detailed for the duty of this post, but as there is no muster roll forwarded to head quarters, those who choose to remain with their families by paying twenty tickals to the Myotsa are allowed to do so, a small part only of the detachment find their way to the frontiers, at this part the force is larger than usual, there are now fifteen men present, and the Myotsa is at Bankok with a party of five. He (the Myotsa) also levies an annual tax of ten pieces on each man, the king's people excepted, who cut sapan wood in his jurisdiction. Their period of service on the frontier is six months, they say they are allowed to bring their families, but do not do so on account of the malaria, intermittent prevailing here in May and October. Here also they are all Talines from the province of Martaban. A part of their duty is to carry the provisions which are sent up by the king to the gold washers on the Belank, of whom I am here informed there were last year 1500 employed, besides 60 men of the Myotsa of Dayiek or May-nam-noi.

January 24th —3h 30m., 11 miles. At 8 left the modern post Moun-g-tseing, and in 11 minutes reach the crossing of the river, which here runs east. Crossing in three small boats occupied us 30 minutes, and in 20 minutes more reach the walls of the old city of Moun-g-tseing (or Lion's city) which must have been long deserted, the walls though well defined, are, as well as the whole interior of the place, quite overgrown

with lofty forest trees, it had the form of a square, of a mile in extent on each face, with a large tank and interior town. The people who accompanied us had no traditions respecting it, except that in former days gold and silver were very plentiful here. 15 minutes more brought us out at the river face, from which it is distant a few yards. An hour after leaving the town we met a party of two Siamese and three Talines, with an order from the Myo-won of Camboorie to the Tseetkay of MOUNG-TSEING to accompany us to Camboorie, as we were however some miles from him he escaped the duty. So difficult is it to get, or so careless are the people in giving information to be depended on, that one of the two Shans told us they left Camboorie yesterday before daylight, and the other at 11 in the forenoon. At 11h 15m. pass the small town of MOUNG-KHÏET, probably descited about the same time as MOUNG-TSEING, the interior was a perfect level, covered with a long even grass, and high forest trees wide apart from each other, and without underwood, giving it the appearance of a park. At 12h 40m halt here by a small puddle of stinking green water, the only water except the river which we left at MOUNG-TSEING we have seen this march, and the Siamese declare there is no other halting place for nearly as far as we have come. We have had a good, perfectly level cart road, though the plain has never been more than four miles across (from information), the soil seems fertile, and capable of affording subsistence to a large population, but with exception of the posts on the river, the country appears destitute of inhabitants, there being only one or two Kareen villages of two or three houses, in the district of MOUNG-TSEING. The See-sa-wat which joins this river at Camboorie is said to have fewer inhabitants than even this, and the intermediate country is a wilderness. We have been much exposed to the sun to-day, which is very powerful, our halting place a perfect level, open, and covered with short grass, the people sleeping about in groups is exceedingly picturesque by the clear moonlight. We have seen to-day hares, partridges, and pea-fowls, and wild dogs are said to be numerous here, larger, with longer hair than the common dog, but

equally varying in colour. Buffaloes, bison, and wild cows have long disappeared, but deer and wild hog are still plentiful.

January 25th—Camboorie, 5h. 20m, fifteen miles Thermr. 6 A. M 66°, Noon 90°. Notwithstanding the repeated assurance of our old Siamese guide, (hitherto they have been Talines,) that the vile water we were drinking was the only water within many miles, the elephant people, when looking for their elephants this morning came on a beautiful stream within 100 yards of us, just when it was too late to be of any use to us. We started at 8 A. M. and marching along a dead level plain, averaging from two or three to six miles in breadth, thinly covered with low trees, very little underwood, with strong crop of coarse grass, the soil apparently good, reached in an hour another stream of water a little N. W. of the road, the march was of one uniform character throughout, and at no great distance from the See-sa-wat river, between which and the road runs a low range of hills, and another of greater altitude, and more rugged and abrupt, between us and the Maynam-noi, at 10h.30m passed another small run of water springing out of some rocks in the plain, the water of which is soft and unpleasant. Here we halted half an hour, from this the grass is shorter, but still rank and coarse. At 12h. 45m we saw the first paddy fields since leaving Maulman, near which we march till 1h. 25m when we enter a plantation of cotton, (which was high and flourishing) plantain, and tobacco, close to the See-sa-wat, which we should have known to belong to Chinese, even had we not seen them at work in the fields, so incomparably superior are they in all their operations, agricultural or mechanical, to the indolent slovenly natives of Indo-China. Along this our route lay till 1h. 50m when we crossed the See-sa-wat, about three and a half or four feet at the deepest, but of considerable width, perhaps 160 paces wide; after waiting an hour at a shed, about thirty feet wide and forty-eight long, enclosed by a palasade of bamboos close to, and partly in the river, and no notice being taken of us, I sent the Siamese interpreter and writer to announce my arrival, and purpose of my visit to the Myo-won, and request an interview tomorrow. The great man was as usual reported to be asleep,

but his writer promised to let him know when he awoke, and almost as soon as my people, the writer made his appearance with a present of ten or twelve trays of fruit, and a civil speech, a few minutes after he had taken his departure, he returned again with three or four trays of sweetmeats and oranges, sent by the Myo-won, with a civil message, and a request to be excused seeing me to-morrow, I however repeated my request of an interview to-morrow, being hurried from delays on the road hither, and have not heard his answer, in the meantime, as usual, the people are not allowed to go out, and two people accompanied my grass cutter when he went for grass. I am told we are still five days from Bangkok, and that it is impossible to take on the elephants by a shorter route than twenty days, up the west side of the Nakoutchathee* river and down the east, the small nullahs being under the influence of the tide, and the mud consequently deep. My informant is the Myotsa of Taung-ka-paung, a wily old Talunc, who came here in the great rising of 1876, (1816 A D)

January 26th.—Camboorie. About 10 o'clock the Myo-won's writer came out to say, the Won would be glad to see me in the afternoon, as he was engaged now listening to the instructions of some Poonghees of great sanctity, who live the greater part of the year in the jungle, sleeping under trees, with no fear of wild beasts. He inquired what I was in the habit of eating, as he wished to give me an entertainment, I told him I was obliged by his kind intentions, but as I never eat but twice a day begged him not to take any trouble on that account. I had found this the best plea for not partaking of their unsavory kindness, as abstinence is considered meritorious, and eating only twice a day quite a virtue. At a little after 1h the same person came to say the Myo-won was prepared to receive me, I accordingly rode in taking with me a double barrelled gun, a flask or two of powder, some caps, and a small carpet. On arrival at a *zayat* on the bank of the river, ten minutes walk from my tent, I found all the officers of the town assembled, one of whom met

* My informant did not appear to know, or at all events did not give us to understand, that this river was a branch of the May-nam

me at the door, and pointed out my seat, a chair on one side of the entrance, and the place for some of my people on the floor immediately in front of me. The Won came in about five minutes, and seated himself on a sort of platform at the other end of the room or shed, which might be fifty feet long by twenty-five broad, his officers were in front of him, crouched on their elbows. He asked the usual questions, when I left Maulmian, the state of the road, how I had been treated and furnished with provisions, &c. &c. I inquired when he heard from Bangkok, the health of the king, state of the country, war with Cochinchina, his own health, &c. &c. and after some time I asked him about the convicts escaped from the jail at Tavoy, he said there had twelve arrived some time ago, two of whom had died, six others had been sent from Maynam-noi and arrived the day before yesterday, the ten remaining of the first arrival, were now in irons in jail, the others were not yet confined, but should be immediately. I had yesterday heard (our people who came in the boats saw them) that the officers for Maulmian and Tavoy had left this the day before yesterday, and the Myo-won now confirmed this intelligence. I had expressed my anxiety to see them, and get them to take charge of these prisoners, to the Myotsa of Maynam-noi, and have no doubt the boatmen mentioning this, was the reason of their starting without seeing me, as they would naturally otherwise have wished to do, I however still urged him to send these men back with them. After much conversation, in which I pointed out to him the article in the treaty on the subject, he refused to send them back without an order from the ministers, as he declined giving them up, I requested he would not allow them to escape, as I should repeat the request at Bangkok, he said they were all in irons except the last six; if I did not believe him, I might go and see them. I of course assured him I had implicit confidence in his word, at this juncture about 30 unfortunate Cochinchinese prisoners were marched in, of whom there were 3000 at Camboorie; I afterwards heard there were near 1000, probably 300 may be nearer the truth, he said six of these men had made their escape, and begged me to apprehend and send

them back, if I should see them at Maulman. I told him the people he mentioned I had seen at Maulman, and on their arrival had assisted them, that he quite mistook the ground on which I demanded these natives of India, that they were felons, condemned to imprisonment for life for murders of the most aggravated kind, which I explained to him, and warned him of their character. After some conversation on the Cochin-Chinese war, he ordered in two or three and twenty small dishes of sweetmeats, roast pork, roast fowls, and soup, all apparently Chinese cooking, of most uninviting appearance, for myself, and different trays for all the people, who did more honour to his hospitality than I could. He then pressed me to stop here for four or five days, as he said was the custom, I however declined remaining more than one day more, and am to start on the 28th. I had by a great deal of inquiry amongst the Talines here learned that there is a good and much frequented road, as was to be expected, from this to Bangkok, by Nongkaw, in six days, and when the subject of my route was discussed, as all matters are here, I intimated my intention of going by that route, without allusion to the attempt made to deceive me yesterday. I spoke of the goodness of the road with such confidence, that no attempt was made to dispute the fact now, but a wish expressed that I should go by boats, or if by land even, that I must go to Rajapore or Pra-ree. This I also objected to doing, as it is considerably out of the direct course to Bangkok, that I had no business with the Myo-won of Rajapore or Pra-ree, and had here waited on him, the Myo-won of Camboorie, and stated the only object of my visit, he said they had no wish to put any restraint on me, that I might go by any road I felt inclined, but the Myo-won of Pra-ree had made preparations to receive me, and would be disappointed if I did not visit him. The subject was then dropped, and I took my leave, near three o'clock, the sweetmeats, &c. were sent after me to the tent, and about nine in the evening the Taung-ka-paung Myotsa came to press again on me the necessity of going by Pra-ree, I again declined going by that route, as my business lay at Bangkok with the ministers, it was decidedly out of my way, and when I got there, how was I to be assured the Myo-won of Pra-

piece would not send me off to some other place, I acknowledged their kindness in wishing to entertain me, and requested him to tell the Myo-won that I preferred going by the route I had mentioned, he promised to do so, staid till near 11 o'clock p m and took his departure. I had a visit also from the second officer of the town, who being ill only stayed a few minutes. On the whole they have been civil and attentive, I cannot however make out the motive of the officers en route to Maulmain avoiding me (which they certainly have pointedly done, unless to avoid refusing to take back the Thugs) as it might have influenced their reception there. The Myo-won here receives from the royal bounty 600 tickels a year, besides youm fees.

January 27th —Received from the Myo-won this morning a present of fruit, &c, and had a long discussion with his writer about the road, they appear determined to take me round by Pra-pree, at the same time to avoid the appearance of constraint. After dinner I called on the Myo-won, according to my proposal of yesterday, he met me at the zayat where I had seen him yesterday, and taking my hand led me to his house just inside the fort. After a good deal of conversation on different subjects, I remonstrated strongly against going round by Rajapore, as I had no business whatever with the chief of that town. I reminded him that the purpose of my mission having last year been intimated to the court, that he himself had been instructed not to detain me (of this I had no doubt), I told him I had already exceeded by many days the time I expected to be in Bangkok, and further delay would render it doubtful whether I should be able to return till after the monsoon, &c &c &c. I naturally anticipate a stay of some time in the capital, and fear I shall not be able to get down any number of cattle before the rains, as the route from Bangkok to Zimmay, should I be allowed to proceed there, will occupy a full month. An attempt was made to convict me of having said I would go by Rajapore, and the Myo-won said he had written before my arrival to the chief of that town that I would visit him. I said I did not see in what way the ends of my mission were to be forwarded by the detour, nor that he should have written without my concurrence to the effect he men-

tioned, requested him to consider whether he was doing right in endeavouring to place restraints on me, which we never attempted with Siamese officers' convoy to our provinces I told him unless I was positively prevented going by Nougkan I should take that route, after a great deal of argument I have been obliged to go by the route they wished With the exception of this dragging me some days out of my way, my reception here has been on the whole very friendly, though the Myo-won's manner was constrained, and the old writer, whom I suspect is the principal obstacle to going direct to Bangkok, prompted him We have been plentifully supplied with provisions, and since my first visit to the Myo-won the people have been allowed to move freely about I repeated the application for the convicts, and mentioned that a sum of 15 rupees each would be paid to cover their expenses on their delivery at Tavoy, he again declined giving them up, as I was going to Bangkok, without an order from thence I applied for a boat, which was furnished, and by putting the heaviest of the things in it, we shall be enabled to make longer marches; one or two of the people also are sick, and unable to proceed by land A number of dishes of meat and sweetmeats were again served to me, and the people who accompanied me; and after remaining an hour and a half I returned home, where the Youkabat (or Nakan) soon followed me with twenty-four dancers and musicians, whom he told me were all of his own household, amongst whom there were eight unfortunate women, Cochín-Chinese prisoners, of whose wretchedness and destitution I have heard a good deal to-day; they remained dancing and singing in the clear moonlight night in front of the Tay till eleven o'clock, when I gave each of the performers a rupee, with which they were apparently well satisfied. Their song was all to one air, though the voices frequently did not keep time, it was rather pleasing, the dancing, if it could so be called, was any thing but graceful, the words sometimes Cochín-Chinese, sometimes Siamese The town of Camboorie is situated opposite the junction of the See-sa-wat and May-man-noi rivers, principally along the bank of the former, it is a long, straggling place, consisting of one long street along the banks of the river,

containing in all 300 houses, and there may be 200 more in the small streets running off, and in the fort The See-sa-wat is here 150 paces, perhaps 250 feet wide, and $3\frac{1}{2}$ feet deep; from the water at its present height, to the point it reaches in the rains, is nearly the same distance as the width of the stream There are lying here about 122 boats, of which thirty-eight are canoes, the others are boats of considerable size A brick fort has lately been built here, of about 500 paces long by 300 broad, without defences, unless two semi-lunar breastworks outside on the river face, with five old guns each, may be so called, the wall appears about sixteen or eighteen feet high, and there are said to be twenty guns within the fort, three gates on each side, and one at each end, there is no bazar in the town, but a few stalls on the single bed of the river, where the Chinese have a gambling shop, and where salted eggs and gnapee are sold in small quantities Upon the whole it is rather a paltry place, considering the importance attached to it by the Burmans, and that it is within six days of the capital Many of the Cochín-Chinese who can speak Siamese, have been questioning our people as to the possibility of reaching Maulmain, and the Talines are equally anxious that some means for their deliverance could be arranged, I have however checked all idea that my visit was connected with such an object

January 28th — Small green pool, S 36 E. 4h 40m, fifteen miles Started at 9h. 15m. having been detained about half an hour for the boat, and in giving a list of the things to be put into it, ten minutes brought us to the end of the village or city, and travelling along near the bank of the Camboorie river, formed by the junction of the May-nam-noi and See-sa-wat, we passed several large plantations of tobacco, and one or two small fields of sugar cane, cultivated by the Chinese, at 10h 55m, cross the smaller branch of the river, about half-leg deep, and passed along a sandy island, with a kind of short willow on it, cross the larger branch by a boat, this however though rather rapid is of no great depth; just after crossing the river, we pass two small villages, since which we have seen no sign of inhabitants The road has been level throughout, and well

travelled, jungle thin, water very scarce, and at this halting place it is green and bad, our party has been increased at the little villages we passed in the morning, and we are now accompanied by thirty men who bivouac at a little distance, but do not however interfere with our arrangements. On starting this morning, some of the Myo-won's people met us with a few baskets of rice and some meat opposite the gate of the town

January 29th —Bausong-roy, 4h. 20m, fourteen miles
Started this morning at 8h. 50m, and marching along a level road, through a thin jungle with long grass, a great deal of which had however been burned, we passed one old plantation of cotton and plantains, the cotton of a kind I have not seen before, being now ready to gather, the crop was small and scanty, but the plants are now two or three years old, the cotton fine and soft, but rather short in the staple. We are now fairly in the alluvial plain at the head of the gulf, saw only one or two small rocky hills to the westward, the water has been scarcer and worse than yesterday, and we were nearly missing this, which is a swamp, as it lies a little off the road, and the people of the few houses near it, who are Talines, or Laos prisoners from Wiang-tchong took flight at our appearance, taking us for Siamese or Taline small officers. It appears that at stated periods, the Talines are branded on the arm, as belonging to the right or left wing of the army, and their name, number, and officer's company to which they belong, entered in the muster roll of Talines, from which time they are liable to all calls for public duty, those only who have entered the priesthood are excepted, and such as can escape, by concealing themselves, till the impress is over, do so. One old woman in her joy to find who we were, abused the government of the country roundly (though several Siamese of our thirty conductors were present), she said the Siamese, bad as they were, were not so bad as the low Talines who form the officers in army; she said scarce a day passed without tears for the old country, now it was quiet she prayed daily that her next transmigration might be a bird to return there, as she had no hopes now of doing so in this life. There are now about 5000 Talines, 1500 of whom receive royal pay, such as it is, some as little as three

or four ticks a year ; all who have reached the height of two cubits and a span, are banded, and they are numerous, as there has been no impress for three years

January 30th —Rajapore, 6h. Eighteen miles Started this morning at 7h. 45m. and in twenty minutes passed through the clearing in which we pitched our little camp last night ; from this, till 9h. 35m our route lay through a jungle, of the same scanty stunted trees as we have had for the last few days, the soil poor and sandy , at 9h 35m pass a village of 15 or 20 houses, and enter a plain covered with long reedy grass, near which we saw the first black cattle we have met with in the route , at 9h. 55m came on the banks of the Song-roy river, here about sixty feet wide, and apparently not more than ankle-deep, with the tide coming in ; and immediately after coming on the river pass a large village, with a number of Chinamen about it Here the plain is about three and a half or four miles across, from east to west, with the range of hills to westward, (along which our route has been throughout at no great distance,) running round to a few points east of south, broken and irregular, and the highest probably not more than 6 or 700 feet , we march along the Song-roy till a little after eleven, when it tends away east, to join the Camboorie river , the plain increases a little in breadth, and contains three or four small shallow lagoons, all along the borders of which the people, principally prisoners from Wiang-tchong, were employed in planting out paddy They have a mode of irrigation here, I have not seen used except in China, by means of a long spoon-shaped light trough, with a long bamboo handle, slung in a high triangle of bamboos, the person using which stands on a slight frame raised in the water, and with a spoon in each hand, by means of the slings, throws the water into the channel for conducting it over the fields to a height of about three or four feet. At 11h. 25m we passed the village of Song-roy of 20 houses, generally of very miserable description , from this, our route lay S. 31 E to the town ; the swampy nature of the ground in one place, and a detour round one or two of the small lakes, kept us till two o'clock before we reached it The boats must have been manned and waiting for us on the town side of the

river, for there started to meet us the moment we halted on the opposite bank, four handsome large boats with platform in the middle, covered with a high roof on four very high posts; in mine there was a carpet and pillow. We pulled rapidly down the river, about a quarter of a mile, and landed at a neat, well finished (I may call it) house, with two wharfs run out into the river, which ran a few feet from the doors, here I found the Myo-won's brother, the Tseetkay, Nakans, and some other officers of the town, waiting to receive me, seated at the edge of the raised centre of the house, there were one or two small China tables and chairs, two or three Calcutta made chairs, and a large old Dutch looking high backed ornamented heavy one in the centre of the room, on which I was requested to be seated. Conversation was confined to a very few questions, when a party with at least twenty trays of fruits, vegetables, and sweetmeats, from the Myo-won, was presented by his brother. The people and my servants were requested not to cook any thing, as every thing ready dressed would be supplied us, and in a few minutes my dinner was brought in, consisting of rice, roast pork, fowls, ducks, and soup, curries of three or four kinds, and some stews; as the curries were not the most inviting, I smuggled my own curry on the table, and managed to make my dinner, after which the people were served in an equally plentiful manner. Two officers (writers), were appointed to attend to all my wishes, a band of eight singers and musicians came by the Myo-won's order to amuse me for an hour and a half, all very well dressed, who remained till 10 o'clock P.M. when our watch was set, and quiet obtained for the night. The music was much less soft and pleasing than that I have been accustomed to hear in Laos, called Siamese. By some accident one of the horses was drowned in crossing the river to-day, he had in the last few years travelled with me upwards of two thousand miles, in the course of which he had repeatedly crossed rivers of much greater width. The Myo-won sent several messages expressive of his sorrow of the accident, and an offer of two or three horses to replace him.

January 31st —This morning the Myo-won sent a plentiful breakfast for my whole party, and at noon, just as I was preparing to take an altitude of the sun, a number of officers came to say he was waiting to receive me, I accompanied them, taking with me two fuzils, a flask of powder, two small carpets, and a piece of Bengal handkerchief. I found a chair placed for me in the centre of the room, the Myo-won seated with a mat and richly embroidered pillow on a sort of wooden couch, at the end of the room, his officers lying before him on the floor, which was covered with small carpets, the room had been ornamented by a Chinese or Siamese artist with beautiful yellow grass, brown trees, green rocks, and blue cows, with houses stuck here and there in most extraordinary perspective on the rocks, and a ship and one or two junks full sail amongst the trees. Some small old fashioned English prints, China lamps and lanterns, with some spears and muskets, completed the furniture and ornaments of the hall, which was about the size of the house erected for me. The conversation was exceedingly constrained, no one joining except the Myo-won and myself, the subject talked of, was of course the object of my mission, which I told him was to convey to the ministers of his Majesty the king of Siam, the assurance of the high esteem and friendship in which they were held by the ministers of the great ruler of India, to increase and strengthen the friendship between the two countries, and an invitation on my part to his people to be more frequent in their visits to Maulmain, which was now a large and flourishing country. He begged me to be perfectly at home, and said there was no restraint on the people with me, who might go where they pleased, &c. &c. I asked him regarding the route, and intimated my intention to go by land, as I had already been delayed longer than I anticipated on leaving Maulmain; he wished me for my own ease and comfort to go by water, and further urged the impassable state of the road, I expressed my disinclination to do so, as confinement in a boat affected my health, he said he would send word to the Myo-won of Nakoutchathee that he might be prepared to expect me, and the matter seemed settled. I remained about an hour and a half. The interview

was I think more stiff and constrained than I have had with any of the numerous native chiefs I have visited in this country. Soon after my return, his brother brought about thirty or forty large trays of sweetmeats, and twelve or fourteen men loaded with cocoanuts, jacks, and other fruits. I begged him to convey my thanks to the Myo-won for his attention and hospitality, and a request that the guides might be ready early to-morrow, as I wished to start in the cool of the morning. The objections to the land route were again raised, and as the only reason assigned was that the Myo-won had written to the Myo-won of May-klong that I would come that way, but that of course if I wished to go by land, I should not be prevented; as I do not know in what way I may be obliged to travel into Laos, I particularly wish to avoid being parted from my elephants, as the state of the roads may be made an excuse for detaining them, and their absence be pleaded at Bangkok as a bar to going up the country at the season when the water is at the lowest, and as I believe one object of some importance will be gained by breaking down the ridiculous restriction to our intercourse with this people, I assured him I asked for nothing we did not readily accord to others, and drew his attention to the perfect freedom from restraint of their officers at Tavoy and Maulman, and repeated my wish to go by land; pointed out to him that we were here to the south of Bangkok, and should now have to return N. E. whereas had I been allowed to proceed, which I wished to do directly, across the country from Camboorie, and which any other person going to Bangkok would have done, I should by to-morrow have reached that city, &c., though making the acquaintance of the Myo-won of Pra-pree had rewarded me for coming so far out of my way, but I now wished to take the nearest route. He said he would take his brother's orders, and went into the town for that purpose. I requested him to say, as curiosity was not my motive, if the Myo-won would say he did not wish me to see that part of the country, I would go by any route he pleased. As he had not returned at 11 o'clock I told the mahouts to get the elephants early in the morning to start by land, as I had agreed with the Myo-won personally in the forenoon. The town of Rajapor., or as it is commonly called, Pra-pree, is of very

considerable size, though I have been unable to obtain any accurate information as to the number of people it contains, from the excessive jealousy of the people on such subjects, and from its extent, have not been able to count the number of houses, as was roughly done at Camboorie. The greater number of the inhabitants, as in that town, live about the banks of the river, outside the fort, which has a brick wall of about eighteen feet high, with an open parapet and ravelin at each corner, two doors in the long faces, and one at the ends, it stands east and west along the banks of the river, which here runs to the eastward a distance of a few hundred paces, it is about 300 paces broad, and 7 or 800 long, with a large portion of the ground waste inside, there were about 200 or 280 boats in the river of a large size, the river is fordable a short way above the town at low water, and the tide does not rise more than four feet opposite the town at spring tides. I am told the Myo-won receives from the king 600 tickels a year, and has the law fees and presents besides. I do not believe, from all I have heard, that any of the chiefs of towns receive so large a sum.

February 1st —Bankiew, 4h 50m., fifteen miles. Sent the mahouts for the elephants at day-light, they found them, contrary to the promise of the people sent by the Myo-won to take charge of them, tied up close to the town. When preparing to start, a message was brought from the Myo-won to request me not to hurry off, as breakfast was preparing for our party, to which I returned an acknowledgment of his kindness, and intimation of my readiness to wait. The interval was employed by me in dispatching two boats I had been furnished with for the sick and some of the royal presents, and by them in again urging me to go by the river, now on the Myo-won's account, as the Myo-won of Camboorie would obtain credit with the king for having prevailed on me to come here, whilst he could not get me to go to May-klong, they disclaimed any wish to prevent my seeing that part of the country, I said I did not think personal motives should have weight with us, that I did not consult my own personal ease in labouring over the hot plains, but that I had been sent by a great government to the

ministers at Bangkok, and that I wished to make the greatest possible dispatch to where I was ordered, and should have done so from Camboorie had I not been prevented, and when I had seen the ministers, I should be happy to comply with their desire in visiting any towns they might wish. The breakfast was brought in and discussed, and we started, the guides were fortunately not ready. We were conducted along the west and south faces of the fort, and whilst halting for the guides at a small *zayat*, half a mile from the town, met a party of labourers coming in from the paddy fields, and on inquiry found that they were just about to lead us amongst muddy nullahs and inlets from the sea, influenced by the tide, against which we had several times been warned to be on our guard by Burman and Talme refugees. The labourers had just pointed out the proper road, when the guides came up, and declared that no road existed in the direction I now proposed to go, that, that road, pointing along a road apparently leading to the salt grounds at the head of the gulf, was the only one in existence, I however took the direction pointed out to us considerably more to the northward, and inquiring of people on the road and at the villages, all of whom assured me we were on the proper road, reached this place at 3h 35m. A few miles north of the town runs a rather deep belt of palmyra trees with common jungle, tending away a little to the northward of east, in which is the high road to Bangkok, with several villages along it, also in the jungle, between this belt and the head of the gulf, a distance of about two days, is an alluvial plain, the lower edge intersected, as already stated, and forming salt fields, the upper edge cultivated to a considerable extent by the inhabitants of the villages along the road, though this plain is said to be covered with water in the rains, so that boats pass along it in all directions, but at this season is perfectly dry near the jungle, so that we had no occasion to go on to the road, which ran a mile or a mile and a half to the northward of our course. Though there was no path, we took the direction pointed out by the few people we met. We passed seven villages in the day, the largest might contain thirty or forty houses, and at the last a large herd of cattle and buffaloes, which sell here

the former at three or three and a half tickels, and the latter at seven, the best carriage bullocks, five tickels, or six and a half Madras rupees; the low price is of course from the absence of a demand, for they are very scarce, and indeed can be of very little use in so swampy a country with a Boodist population, though the Siamese no more than the Burmans object to eat beef, and there are not wanting people to take on themselves the sin of killing the cattle. Our guides here in no way interfered with us.

February 2nd—Ban-ta-chang, 5h. fifteen miles (close to Bankem). One small well of brackish water formed the whole supply for our party after an excessively hot day's march, yesterday we were not sorry to leave our last halting place, which we did at 7h 40m A M. Our route has been exactly of the same character as yesterday, sometimes across the country through the paddy fields or reedy plains, sometimes along the main road, in the jungle and palmyra forest which skirted it, all along which are the villages of the cultivators, consisting of small groups of five or six houses, and the population just along the line of road is considerable. A small portion of the plain crossed to-day is under cultivation, the largest patch we crossed at 9h 30m. with a few hundred head of cattle and buffaloes grazing about. At ten we cross a small jeel, and close to our present halting place another long one, extending some miles into the plains, and here three and a half feet deep with a muddy bed and covered with floating grass, it did not seem influenced by the tide, and is used by the people for domestic purposes. We are still accompanied by the thirty men sent with us from Pra-pree, they have not to-day interfered in any way, or been of the least service to us.

February 3rd—Nakoutchathee, 5h 20m., seventeen miles four furlongs. The people who have accompanied us from Pra-pree left us last evening, (the lake being the boundary of their district) without any apparent communication with the people of this district, or stating to me their intention, and we had some difficulty in procuring a guide to-day, who would not approach this village, and returned as soon as we came in sight of it. We started at 7h. 30m. and travelled along a road of the same charac-

ter as the last two or three days, still at an average distance of about two days from the sea. Cutting across the skirts of the plain, by which we have saved a day, as it is two days by the high road from Ban-ta-chang to Nakouchathee, we crossed in the course of the day eight muddy lakes or long pools of water, with mud, weeds, and water, varying from 2 or 3 to 6 or 8 feet deep, the worst one we crossed in a small boat just capable of holding two persons, we passed also seven straggling villages, but as they were within the belt of trees, we had no opportunity of judging of their extent, except by inference, as though there was a good deal of cultivation it was perhaps less than the two previous days, the cattle and buffaloes rather more numerous. We saw two herds of perhaps 200, the others consisting of a few, say four herds of 10 or 12. I was told by our guide to-day, that the best buffaloes sell for 10 or 12 tickels, and good bullocks, about the same price, though as much as 20 tickels is sometime paid for a choice cart bullock, inferior at 6 or 7, as cattle are cheaper near Camboorie, but not abundant in any of the southern provinces. There were a few people at work in the paddy fields, but all their thrashing floors seem small, as if the cultivation in the neighbouring villages was principally for their own consumption, the largest floor we have seen is at this place, where there is a stack of paddy ready to be trodden out, which my agricultural people estimate at 1500 Burman baskets, and I was told in crossing the fields to-day that it sold at about 9 tickels for 66½ Burman baskets, but their measure seems arbitrary and uncertain. On arriving here the first person we met in the village (for it does not contain more than 200 houses) told us that the Myo-won was at the north end of it, preparing the zayat for us, and on arriving here we found by the chips and new thatch that it had been new roofed yesterday. Just as my people were going in to the Myo-won to report my arrival, the Tseetkay and town officers came out to inquire who I was, where I came from, and where I was going, though by their preparations they were certainly aware of our coming. I satisfied them on these points, and asked if the Myo-won of Pia-pree had not sent, as he had promised me he would do, to the officers here, stating the purport of my

mission, and a request to furnish me with what I might require, they said they had not heard a word of my approach before the moment of my arrival, they said it was impossible to take elephants and horses by this route to Bangkok, that indeed there was no road even for foot passengers. They departed with the information they had obtained to the Myo-won, who in about an hour sent to say he would be glad to see me if I wished to call on him, and I did so before dinner. After the usual topics were discussed, he repeated with such earnestness and apparent sincerity, appealing to his age (which may be about seventy-eight) as a voucher for his veracity, that the road was impassable between this and Bangkok, in fact that no road existed, that it was scarcely possible to resist conviction, particularly as I had not had time to make any private inquiries amongst the people, and had learned nothing about the road except the general assertion of all we have asked about it, that it is good and daily travelled. I was obliged to consent to his writing to the ministers, and as I had no Siamese writer, I myself wrote to Mr. Hunter—a British merchant who has resided at Bangkok many years, and has often been the channel of communication with the ministers both from Singapore and Maulmain—stating the fact of my arrival here, and begging him to intimate the same to the ministers, with the reason of my not writing, and a request not to be kept longer than necessary. I much fear it will be impossible, in compliance with the terms of my instructions, to have any of the cattle in Maulmain by the beginning of May. My previous information regarding the goodness of the road has been confirmed by the people of the village and the Ponghees, who also told my people that messengers from Pra-prec arrived here yesterday with a communication regarding me, the nature of which I have not learned.

February 4th—Have had communication with the people of the village to-day. I endeavoured to send some of my Taline people to a village of their countrymen on the opposite side of the river to buy fowls, and inquire about the road, but a boat was refused them, and the town officers offered to procure any thing we wanted.

February 5th.—We have received from the town provisions

for the people, and boughs for the elephants, which we are obliged to tie up at night, as there is so much paddy exposed at this season. This afternoon I had a request from the Myo-won that I would call on him, with which I immediately complied, and found that our boat had arrived at the capital during the previous night, and the ministers had sent an order to the chief here to furnish me with boats to proceed, leaving the elephants and horse. I endeavoured, without success, to take the latter, as I should want him, they made all manner of excuses, said there were no boats large enough, I should have to wait a day, as they must send down the river for one; I told them, I had seen several boats here sufficiently large, they said they were unsteady and unsafe, I replied the horse was accustomed to boating, that I had carried him 500 miles in a boat last year; they then shuffled from one objection to another. I begged them to say at once if I would be allowed to take him or not, as I had no intention to oppose their wishes, but if not positively prevented, I wished to take him with me as necessary to my comfort, though they would not pointedly refuse, they would not allow me to take him. After some conversation on matters of no interest I took my leave, and they set about preparing our boats. I this morning sent a Taline lad (the head mahout) to a village about a mile and a half down the river, the only Taline there is (with his family) employed in making bricks for the Myo-won, to whom he is a bonded debtor, he said that that was the commencement of the road to Bangkok, that buffaloes, people, and elephants travel it every day, that about "a call" inland from where they were, the jungle terminated, being only a narrow strip by the river, and from thence with a glass they might see three *zayats* on the road at about equal distances, and from the last, from the back of the elephants, they might see the village Quankalanai (Taline king's village) on the banks of the May-nam river, that the distance was easily done in half a day by an unencumbered man, that he himself came that way a short time ago, his residence being on this side of the May-nam, in little more than half a day with a little boy of his, whom he pointed out. The family were all familiar with the road, and some of the women

made a sketch on the ground. A short way above the town is the entrance of a canal, between this branch and the main river, and on the banks of this canal the second of the three *zayats* before mentioned is situated, from this the road runs along its banks. If crossed at the first *zayat* there is another road which comes on the river *May-nam* above *Bankok*. Had I been possessed of this information yesterday I need not have lost so much time here. This is rather a large straggling village, along the banks of the river of the same name, containing about 300 houses, and ten or twelve large *Pounghee* houses, though there does not appear to be more than twenty priests. The houses are here small and ruinous in appearance, nearly all built of bamboos, that of the *Myo-won* only a little larger than the rest. He is said to receive from the king 200 ticks a year, the *Tseetkay* and *Ngakan* 100 each. The river is about 160 or 200 feet wide, with soft muddy banks, and apparently of considerable depth, the tide rises here four feet, and large masses of weeds knit together by the root, growing vigorously, some of them having a surface of sixty or eighty square feet, float up and down with the tide. On asking the old *Myo-won* to-day the distance from this to the sea, he said he could not tell, never having been there, I learned however that it is about two days by the river.

February 6th.—Embarked in four boats, and started for *Bankok* at 9 A.M. Proceeding south-easterly, passed at 9h. 30m. a small sugar factory with two mills, with high conical thatched roofs, the roofs of the boiling houses of the same material, and apparently very low, considering the large fires that were burning in them. At 9h. 55m. passed the end of the road leading across to *Bankok*, at 12h. 30m. halted at a small village for the people to breakfast, my servants' boat was overloaded, and did not come up till near three o'clock, when I had breakfast and dinner in one, to prevent a second halt. Started again at 3h. 45m. and continued pulling with the stream till 9 P.M., when we halted for some hours. We passed in the course of the day many small villages, almost entirely occupied by Chinese employed in the manufacture of sugar, in all eight small establishments, the largest with four mills drawn by

one or two buffaloes each for breaking the cane, the heaps of firewood opposite each seemed disproportionally large. The banks of the river are excessively low, but at the village where we halted for breakfast, on proceeding about a gunshot in land, you pass a belt of cocoanut trees, with a good deal of under-wood, and come out on an extensive plain, which appeared to reach to the May-nam, quite dry at this season, and covered with paddy stubble. Here we were again assured of the existence of a road, perfectly dry and good, and the fact of an elephant (called white, but which only differed from the common ones in having a reddish coloured head) having crossed lately to Bangkok.

February 7th—Started 1h 30m A M with the moon, the fog which did not clear up till 8 o'clock was so thick that nothing was to be seen. The east bank of the river, near which we kept, was of the same character as yesterday, but fewer inhabitants, indeed, I did not see a village till we reached this place. We halted at a custom house chokey from 5h 15m till 6 A M just before reaching which we passed the cross branch leading to the May-klong, the banks of which are thickly peopled by salt makers, the sea water being evaporated, is repeated by fresh artificial inundations into quillets like those of a paddy field, the salt is sold at three annas a basket, and pays one rupee eight annas duty. Passing the chokey we leave the main branch of the river, which runs away westerly to fall into the sea, and at 7h 50m. enter the Maha-tshi Canal, which runs north-east to Bangkok; just above the bifurcation is situated MOUNG-TACHIN, an uninhabited low square brick fort, and immediately below it a village of Tahnés of nearly 100 houses, joining which is the Siamese town of MOUNG-TACHIN. The water here being salt they get their water from Bangkok for six months in the year, the Chinese, who appear to monopolise the traffic of the country, bringing it down in jars, or in perfectly tight boats which they fill, the price is sufficiently moderate. Here a tay had been built for our reception, which we reached at 8h. 15m. having been on the way about six hours. The Myo-won's brother was at the tay to receive me, and he himself soon afterwards came out in a sort of Chinese monshell, he was dressed in China

crape, indeed the whole furniture and ornaments of their houses, and most of their clothes, are borrowed from that people. He was quite civil, and remained about an hour, he told me it would be expected I should remain here till the next day, against which I in vain remonstrated. The people were all feasted, the dinner placed on little tables in the Chinese manner, and an abundance of pork and vegetables, fruit, sweetmeats, and tea, &c. &c. &c. were brought out for me. The Myo-won told me there were about 1500 Talines here, and I learned afterwards from a brother of the Hloot-dăn writer at Maulmain, who is a refugee and most anxious to get away, that there are on the different branches of the river about eight or nine hundred families of Talines, many of them employed in making salt.

February 8th —Bankok, 13h 30m. About 7 A.M. the Myo-won came to the *ayut*, having previously sent out breakfast for myself and the people, and said we had better now start. He asked a number of questions regarding the objects of my mission, which, having the orders of the ministers, and boats sent by them to convey us to Bankok, he ought not to have put, as however I had no object in refusing, I answered him in detail. He came to the end of the wharf to see me off, and hoped to see me on my return. The boats which had arrived from Bankok in the night were large, commodious *paungs* (long boats with a house on them) sufficient to convey every body with comfort, manned, the one by twenty Talines, the other by twenty Cummins, or Cambodians; the Talines were dressed in blue shirts and trowsers, and black bamboo-work hats, and the Cummins like Malays, whom they very much resemble in appearance. We started at 9 A.M. the tide turned against us at 10, and our progress was consequently very slow, at 4h 45m we were obliged to halt from want of water, and remained till past 10 P.M. when we started at quarter flood. At 11h 20m P.M. we enter a cut made from the head of the Mahitchu to the small stream which falls into the May-nam, which completes the communication through the Nakoutchathee branch between the May-nam and May-klong, this we passed in seven minutes, and in half an hour got into deep water on the Bankok

side of the cut Since dark, the light in the boat prevented us seeing any thing on the banks At 4h A M halted at the British factory, on the side of the river opposite the fort and city of Bankok, and found Peadadic, the port Captain, a Benedito (who has received from the king the title of Peavitsit) commandant of artillery, and Pascal, all native Christian Portuguese, waiting my arrival at a mat house, Mr Hunter, under orders from the ministers, had prepared for me just between his own compound and the river Mr Hunter, who has a Siamese title, and whom they consider in some degree as a Siamese officer, also came down to receive me

February 9th—Bankok About seven or eight o'clock a message was brought from His Excellency the Praklang (minister for foreign affairs, whose house is on this side of the river, and close to the British factory) requesting to see Mr Hunter, who immediately waited on him, after he had been gone some minutes, he sent a note to say the Praklang wished to see copies of the letters, if I had them, and had no objection to send them (to which as I saw no objection) I forwarded them by the person who brought the note During Mr Hunter's absence a son of the Praklang's, an exceeding intelligent young man, came to see me,* and a present was brought me from the Praklang of fruits and sweetmeats, and Mr Hunter, on his return, said the Praklang was very much pleased with the letters, and would be glad to see me in the forenoon About twelve o'clock boats were reported ready to take us to the house of the minister, but just as we were starting, a second message arrived to say the king was so much inclined to be friends with the English, that though the letters were not addressed to him, he would receive them as though they had been, and that a boat would be sent for them, and as the letters were to go to the king, the Praklang begged us to defer our visit till the evening. In a few minutes one of the royal state boats, with a roof of embroidered cloth of scarlet and gold, and rowed by about

* I afterwards doubted if he came on my account, and had good reason to believe he did not

forty men in the royal livery (red jackets), and commanded by an officer, was announced, and a proper vessel for the reception of the letters brought up, covered with a cloth of gold embroidery, on this I placed the letters both of the secretary of the government of India and the commissioner, and carried them myself (a Siamese officer covering them with a red umbrella) down to the boat, where they were respectfully received, placed in the centre of it, and covered with an umbrella. We departed attended with three other state boats. Soon after dinner a message arrived from the Praklang to say he had sent boats for our conveyance, and was ready to receive us, I accordingly went, Mr Hunter, Captain Browne, Captain Hughes, Mr Smith, and Mr Hayes accompanied me. Mr Hunter, who kindly acted as interpreter, and myself went in the state boat sent for me, and the other gentlemen in Mr Hunter's boat, the Ghyne-Goung-Gyoup, a Burman officer who accompanied me, and whom I begged Mr Hunter to mention to the Praklang, and some of my Burman followers in a second government boat, we reached the Praklang's in about five minutes, and found him with the second Praklang and several other officers of rank already assembled, chairs were placed for us at the opposite side of the hall to where the Siamese officers were crouched on their elbows, and coffee was served to us in a handsome set of Dresden China. The hall was a long and handsome room, entirely in the Chinese style, and splendidly lighted up with English lamps and chandeliers. We walked at once up to the chairs, when seated I saluted him by raising my hand up to my forehead, removing our shoes was not once alluded to, indeed all the English gentlemen always retain them when visiting His Majesty or his ministers. Conversation was entirely between the Praklang and myself, except for a few minutes, when he addressed himself to the Goung-Gyoup through a Taline of his household. I explained the purpose of my visit to be to assure them of the wish of the Indian Government to strengthen, if possible, the already firm friendship for many years uninterrupted, and begged them to receive the thanks of the commissioner for their kindness to our traders, and for their prompt endeavours to discover and

release Mrs. Breisley.* I expressed my sense of the friendly act of the king in receiving the letters himself, the Praklang replied that the Siamese government were equally anxious with the English for the increase of existing friendship, and were much obliged to the government of India and to the commissioner for sending, and to myself for coming through such a desolate jungle as that I have crossed. I was asked the usual questions as to the health of the Right Hon'ble the Governor General of India and other members of Government, how long I had been on the road, how I had been received, and whether all my people were well, to which I returned the usual answers, and expressed my thanks for the kindness which I had received. I mentioned the deception practised by the governor of Nakoutchathee, he said it was all out of kindness and consideration for my own comfort, and laughing heartily, he said he could not conceive how any one could prefer travelling in the sun to lying quietly on his back in a boat, and progressing by the labour of other people. He then alluded to what I had mentioned to him through Mr Hunter in the morning, the indignity they had offered in making the walls of the hall they had prepared for me and my people of materials which had been used in the funeral of the late queen, than which, according to the superstitious notions of the Burmans, and of course of the Siamese, no greater insult can be offered in Burma, no one but the Toobayazah (who with his whole family are so degraded that no one will associate with them) will touch any article which has been so defiled, in fact, with the peculiar notions of these people, it was impossible for me to avoid mentioning it, he said they had no such feelings regarding these

* The wife of an English gentleman who left Mergui with his family in the disturbance in 1829, with the intention of applying to the Penang government for assistance. They were supposed to have been murdered by their Malay boat's crew as they had a good deal of property on board, but as reports reached Penang and Maulmain, where some of the lady's friends reside, that she had been seen in some of the Siamese Malayan states the commissioner in the Tenasserim provinces wrote to the ministers, who at once sent for the people described, they however turned out to be Burmans who had accompanied some ship's officers many years ago, and had no wish to return.

things in Siam, which I know is not true, and Mr Hunter had heard the people in passing making remarks on the materials, but was not aware of the feelings on the subject. The Praklang offered if I wished to have it immediately taken down, I told him that of course I should be obliged by his doing so, as I could not use the house until it was altered. The Praklang seemed excessively annoyed that I had been told of it, and gave orders to prevent the people communicating with my followers, of this I complained, and asked him to remove the restriction, he said they have always been enemies with the Burmans, and could not now feel otherwise, but as they had come with me no restraint should be put upon them, but they must tell the officer on duty at their quarters when their friends came to see them. I pointed out to him, that these people had no more to do with the Burman government than the Siamese, and that I only wished them to have the same liberty the Siamese had when they came to Maulmain. He said such was their friendship for the English, that they might go when and where they pleased. He then asked me if I had served in the last war with Ava, and whether it was likely we should go to war with that country again. I explained the conduct of the present Burman government towards Colonel Burney, the forbearance of the government of India, and its wish to avoid a war, but that fears were entertained that it would be impossible, from the warlike preparations made by the present king, his refusal to consider himself bound by the treaty of Yandaboo, or receive the present resident. A good deal of conversation passed on this subject, he did not, however, proffer any assistance, nor did I think it necessary at this meeting to make any request about the cattle. He asked me how and when I proposed returning, I said it was impossible for me to say, he assured me I might go in any direction I chose, by land or by water, and remain as long as I pleased, he requested me to wait a couple of days, when I should be introduced to the king, for which honour I expressed my thanks, we took our leave and returned home. The Praklang is a fat, good tempered old gentleman, about sixty, he received us with nothing on but the cloth round his loins, seated on a raised platform or square couch.

His manners are said to be much changed since his first arrival at his present dignity, he was then haughty and imperious, he is now friendly and affable, a great favourite of Mr Hunter's and all Europeans frequenting the port. In the evening Coon-sit, the son of the Praklang, who is intimate with Mr. Hunter, and whom he meets on terms of perfect equality, came in for an hour to our residence, he is a modest and unassuming man, of considerable intelligence, he writes English pretty well, understands nearly all that is said to him, and speaks a little. He has considerable mechanical talent, and has just finished a ship on an English model of about 400 or 500 tons, he is by some said to be an eaves-dropper, and to take advantage of his intimacy with Mr Hunter to listen to and report to his father any inadvertent remark made by Europeans

Memoranda respecting the existence of Copper in the territory of Luz, near Bela By Captain DE LA HOSTE, Assistant Quarter Master General, S R F.

[Communicated to the Society from the Political Department Government of India]

During the absence on sick leave from the Sinde Reserve Force, Captain George Boyd, of the second Grenadiers, performed my duties, and having heard that antimony was procurable near a place called Shah Bellawl, he sent one of the guides to survey the road to that village, and make inquiries on the subject of antimony being found there

On the return of the guide (second guide Esso Rama) he brought with him specimens of *lead* as well as of antimony, both of which were sent by Captain Boyd to Dr. Hedde, Assay Master in the Mint, Bombay. Having shortly after arrived and assumed charge of my appointment, it became my duty to extract the route from the guide's field book, when on questioning him respecting the place to which he had been (Hoj Samote) I found he had been informed, that in former days copper, silver, and gold had been found in the mountains near that village. Considering the report worthy of being inquired into, I sent for the brother of Navillull, named Sukkaramdass, and asked him if he had ever heard any thing of the report, he informed me that he had, and that a banian of Kuirachee

had been near the town of Bela, and brought away specimens of copper ore, which he melted and sold at Kurrachee, making a considerable profit, but that the Jam of Bela had heard of, and prohibited his returning, having punished those who gave him the ore. I requested Sukkaramdass to bring the man to me, or his son, if the man himself was dead, as I feared he was. On the 4th December Sukkaramdass brought the son of the man who had been to Bela, and his statement is as follows.

Twenty years ago, the informant, a banian named Kattoo, and his father Phuth, having dealings at Sonmianee, were informed that tamba (copper) was procurable from a mountain near Bela, they accordingly went to within four coss of the mountain, and got about three maunds of ore from some Beloches and Baboonies there, they melted this, and it yielded nearly half a maund of excellent copper, they took a very small specimen of this, and went to the brother of the Jam of Bela (Kesser Khan) and offered to work the ore under his protection, he at first seemed inclined to listen to the proposal, but an old man, named Neroo, of Shikarpore, said, that if he agreed or caused his brother Ali to agree, he would lose the country, on which both Kesser Khan and the Jam Ali desired the informant and his father to go, and told them if ever they again came there, they would be buried alive. They left Bela, and brought with them the copper they had concealed, which they sold at Kurrachee, making a good profit. The following questions were put by me to the banian.

Question How did you go to Bela?

Answer By Sonmianee.

Q Is there any other road to it?

A Yes, by Shah Billawl, and the Kunnaraj river.

Q How far is the Kunnaraj river from the place where copper is found?

A I believe about 20 coss, but do not really know, never having been that road.

Q Where did you get the ore (muttee or phatur) from which you extracted the copper?

A From a hill 12 coss south-east of Bela, some Beloches brought it to us.

Q Do the people work the ore ?

A No, they are ignorant Mahomedans, and think of nothing but their cattle and thieving

Q Is it known to many that the ore exists ?

A I do not know ; but believe it is, the Jam is aware of it, and some of his people

Q Of what description was the copper you brought ?

A Of the best, equal to that sold in the bazar, which is sheet copper, and comes from Velété (Europe)

Q What average does the ore yield ?

A Some will yield $\frac{1}{2}$, others $\frac{1}{3}$ or $\frac{1}{4}$, but the average is a little less than $\frac{1}{2}$

Q How did you extract it ?

A We simply melted it with wood in a mud furnace, and the copper ran off like a stream of gold

Q At what cost ?

A At that of the firewood, which is mere nothing

Q What is the value of copper here (Kuriachee) ?

A Sixty rupees for 80 lbs the best

Q Do you know the value of 80 lbs of copper in Bombay ?

A I believe, about 42 rupees.

Q. Where is it brought from ?

A It is sheet copper, brought from Velété (Europe)

Q What would be the cost of bringing 60 lbs of copper from the place you had the specimen you speak of ?

A I could, I think, bring 60 lbs of copper to Kuriachee, and sell it with profit for 30, or 28 rupees less if worked on the spot

Q Are any other metals found where the copper is procured ?

A. I cannot say, we searched by stealth, and were afraid of being discovered, but it is said that silver is found in these mountains

Q Did you ever hear of a black substance like charcoal, which burns well, being found ?

A No, I never did, but I have told you, how much afraid of being found out we were

Q Could you shew me the hill from which you got the copper ?

A Certainly, I saw it plainly, and could point it out to you

Q Is there much of the ore ?

A Yes, it is a mountain, and you could get any quantity

Q Are lead and antimony found there, (Shisa ? Soorma ?)

A Yes, in abundance, the latter is exported

From the foregoing information, it appears to me, that no doubt can exist respecting the existence of copper in the vicinity of the Kunnaraj river, and Bela

Firstly, Because the guide heard such a report at the spot from the people of the place

Secondly, Because it was known to the native Sukkaramdass

Thirdly, Because I have conversed with a person who declares he has been there, and because it is well known to more than one person, that he had procured copper and sold it at Kurrachee

This statement is clear and distinct, and I think at least worthy of notice and inquiry, if not of implicit belief

P S I have been promised specimens of the ore, and that it shall be melted in my presence, when brought it is my intention to weigh the ore, and ascertain what proportion of copper it yields

Memoir on the Climate, Soil, Produce, and Husbandry of Afghanistan and the neighbouring Countries —By Lieut IRWIN ¹

PART IV

Husbandry and Cultivation

165 It was originally my intention to have attempted a treatise of considerable length on this subject, in which would have been mentioned all the cultivated products, as far as ascertained, of all the districts To this would have been added an account of the operations of agriculture in some of the most interesting and best known of them, with some details of the life of the poor. Various reasons now withhold me from this attempt, and among them the chief is the want of time to execute it with

¹ Continued from p 1015 vol VIII

tolerable accuracy I have in consequence greatly restricted the plan. The matter which is here to follow, relates to two heads, 1st, Some particulars of the husbandry of these countries in general, 2nd, A review of the districts, in which an attempt will be made to estimate, or enable the reader himself to estimate, their present degree of cultivation, the supplies they yield, their population, and the distinction of their industry, this is, as it were, the summing up of all. It is much to be regretted, that it is the most difficult, as well as the most important of the subjects attempted, and that in which the conclusions drawn, will the oftenest be found vague, unsatisfactory, and erroneous, nor could it be otherwise, if we advert to the natural difficulties of the subject, when it is necessary to proceed on report merely. The witnesses, though numerous for the elucidating other subjects, were few for the elucidating of this, which requires many concurring testimonies, and much minuteness of testimony. The local and national vanity of informants, not to mention individual prejudices and hasty judgments, forbid our relying on their opinions as judicious and impartial, could they be relied on, still there is much difficulty in ascertaining the exact force of those comparative terms, which in all cases must be used, for they assume a different meaning according to the standard to which the mind of the speaker has been accustomed.

SECTION I—Of Husbandry

166 Lands in these countries are divided into irrigated and not irrigated, or in the local Persian *abee* and *lulm*, this last term I have for brevity's sake retained. *Lulm* is itself of various kinds, that which most strictly deserves the name is commonest in Chuch and the plain of the Mundurs, where the quality of the soil is excellent, the fields are merely ploughed in the ordinary way, and not divided into partitions, nor is any other contrivance used either for the retaining the rain which may fall on the surface, or for receiving any supplies from other quarters. But in general, *lulm* lands have some advantage in this particular, natural or artificial. In hilly countries the hollows which ne-

cessarily receive part of the rain falling on the neighbouring heights are cultivated in preference, others are so situated that it is easy to turn on them the water of nullahs, and these are not reckoned irrigated, but *luhm*, (see paragraph 78) In Toorkistan, certain lands are distinguished into a class as receiving in the spring a great deal of thaw water. There are other lands, which depend entirely on the rain which may fall on their own surface, but have been provided with a high bank of earth which surrounds them and retains the water, such may be seen at Oormul, a village about 9 miles south-east of Peshawar, they are every year under crop from one generation to another. There is still another species of *luhm* quite distinct in its nature from all the preceding, being land moist in itself, without requiring for the success of the crops raised on it rain or any other supply, such is in Cabul called *za*, and in that, and similar climates, is commonly in the state of natural meadow. In Hindoostan are considerable tracts of it, being the low banks of rivers subject to be under water for a great part of the rainy season, and large spaces lying under the great northern mountains. In Mooltan, where it is considered as the most valuable species of land, it is called *sew* or *seo*, that is literally border, because it lies near the rivers.

167 Irrigated lands too, may be divided into species whose differences it is important to note. Some lands are only imperfectly irrigated. The Kamojoe Kafirs turn the water of springs upon their fields, but the supply is so defective, that summer showers are anxiously looked for. In most cases, rain in the accustomed season is welcome to the owner of even well irrigated lands, as saving him the trouble and expense of watering. Irrigated lands may be divided into those which depend on springs and natural streams, secondly, those which depend on wells, thirdly, those which depend on *kahrezas*, fourthly, those depending on dams. The first kind contains several species. In the valleys of mountainous countries, and in plains under mountains, it is easy to conduct the water of streams from a higher level upon the fields, and this constitutes the first species, but in open and champaign countries the difference of level is seldom so considerable as

to admit of this, it is therefore necessary in watering from the rivers or the canals which are drawn from them, to raise the water by machinery I have heard that on the bank of the little river Turee, which runs near Jumboo, and afterwards falls into the Chunab, there is a machine for raising water out of it, which is turned by the current of the river itself. But I believe no other instance is known, where instead of the force of the water a living force is not employed, this species therefore approaches to the second kind, or that of wells In Mooltan and Sindh, the most common mode of watering is by what are called *jhulars*, which are half wells cut out of the edge of the channel within which the canal runs Jhulars are used by the Daoodzyes and Mihmudzyes, and are not unknown on the banks of the Oxus, in the dominions of Bokhara; but in the whole of Toorkistan, the only mode of irrigation worth attention is the first species, or that in which streams are turned upon the fields.

168 Wells may be divided into three kinds, the 1st is the catch well, which in Hindoostan they call *Dhenkulee*, or rather that name is applied to the pole, which in this species is used. 2d, The Persian wheel, called in Persian, *Churkh-Chah*, and in Hindoostan, *Ruhut* or *Hurt* 3rd The bucket well The first species is proper only when the depth to the water is very small In the Punjab it is sometimes used in irrigation In Cabul and Kushineer it is employed only in wells whose water is drawn for domestic purposes The Persian wheel is proper for moderate depths, it brings up the water by means of pots, in a manner already described by travellers in Egypt, in which country it is very common I believe it to be found in Mesopotamia, and in certain quarters of Persia, but in large spaces of that kingdom it is utterly unknown, neither is it known in Khoorasan, and it is barely known in Bactria and the west of Toorkistan It is this wheel which is worked in the *jhulars* of that country There was once a Persian wheel in Cabul, but now there is none west of Jellalabad In Peshawur, Chuch, and Sindh, it is the chief kind used, it even extends into Seewecstan, but in that country streams are partly used in irrigation, and for drinking they have another kind of well, to be

mentioned Towards the quarter of India, we may trace the wheel through parts of Chuch, Jodhpoor, Oodpoor, and Goojrat as far as Bombay, in the north it extends to Loodhiana, in the upper part of our Dooab, but it is lost as the traveller proceeds thence towards Delhi There is only one east of the Ganges There is no doubt that it might be adopted with great advantage in all our provinces, especially where the water is at a medium depth below the surface, but where it is beyond fifty feet, the weight of the pots is so great that the use of it will be no longer economical, and instead, ought to be substituted the bucket well, which is the third species enumerated It has some varieties, which need not here be adverted to, as only one is well known in these countries The bucket is of leather, and is raised by a single rope which passes over a pulley, and is drawn by cattle, this is the commonest well in Toorkistan and Khoorasan, where however it is not used in irrigation but only for the supply of water for men and cattle The pasturing tribes in the west of Toorkistan and north-west of Khoorasan carry buckets with them, with which they draw water In India this species of wells is on the whole the commonest, in the desert and the arid tracts lying east of it, the water is at too great a depth in the soil to admit of any other

169 The third species of irrigation is still more expensive and operose It is that by kahrezas, or aqueducts, by which the water of a hill or rising ground is brought out at its foot in a rivulet, to be disposed of at the pleasure of the farmer A kahrez is usually made in the following manner —A well is dug at the spot where it is intended the water shall issue, above it, in the acclivity, is dug another at the distance of from five to twenty yards, according to circumstances and the custom of the place. It is said great skill is required to judge what hills will yield a copious rivulet and in what line it is most advisable to conduct the kahrez. The wells are continued at distances generally equal, until the owner thinks the quantity of water will be sufficient, or until the depth of the wells (which however does not increase at the same rate as the height of their summits in the acclivity) becomes so great that the expense ex-

ceeds the advantage. In Ghaeen, Toorshish, and some other parts of Khoorasan, the highest wells are sometimes 70 yards deep, but in countries better supplied with water, they are much shallower. All the wells are connected below by means of an aqueduct through which water flows to the foot of the hill. Kahrezas are known in almost all parts of Persia and Khoorasan, in the west and middle of Bulochistan, in the country of the Tureens and Buloches, in the table land of Ghuznee, and even Cabul, but they are not to be found east of that district. There is at present not one in repair in the whole of Toorkistan, but in the last generation a considerable number were dug by Koobad Khan Undijanee, lord of Koonduz, with a view to the cultivation of hilly wastes called the Dushti Jubulda, but they are now gone to ruin. Very good kahrezas will turn a small mill of the country. The most famous is that in the neighbourhood of Ghuznee, ascribed to Sultan Mahmood. Including its branches it is asserted to be 12 koss, but this is probably an exaggeration. Many kahrezas are two miles long, and in some quarters a great one will cost 20,000 rupees. Such works do great honour to those nations, and are one proof out of many of their industrious dispositions.

170 Wells are proper in level champaign countries and plains, in which water is found throughout at a moderate depth, natural rills are chiefly useful within hills of considerable height, or at their foot. Kahrezas are natural to a country when the hills are low and unconnected, and consequently send out no constant streams, but when there are found vallies among such hills, which in the seasons of rain receive the water of the neighbourhood, but are dry during the remainder of the year, it may become advisable to retain that water (to be used when in future most advantageous) by extending a dam across the valley in a convenient situation, these are the dams most common, and which peculiarly deserve that name. The water of a feeble stream is sometimes dammed up for future use, and dams are often required in drawing a canal from a river, or diverting the channel of a constant stream, but such fall under the first species of irrigation. Rain water dams are common in the Soobhmanee hills, and in some quarters of Secweestan. There

are ruins of very magnificent dams within the Paraparnisan mountains. Somewhat similar to dams, are tanks, very much used in irrigation in some quarters of India, but very little in any of those countries, and in most of them not at all. The method of scooping water is probably unknown beyond the provinces which border on India.

171 India has two harvests in the year, the products of which are for the most part distinct, but not always. The *rubbee*, sown in autumn and the beginning of winter, is cut in the spring, and consists chiefly of wheat, barley, chunna, musoori, peas, and beans, most of which are raised in cold climates also. The *khureef*, sown during the rains, or immediately before them, is reaped in the autumn, which is the harvest time of the higher latitudes, but the khureef products are seldom capable of being cultivated to advantage in them, being rice, maize, jooaree, bajra, moth, moong, oord, murlwa or baggy, and some others. These two harvests thus distinguished, extend as far as Jellalabad and Lughman, and generally to the cold climates, but these last, and also the warmer ones beyond them, are commonly said to have the rubbee only, this is strictly true of the very coldest,—such as the Tibets, the greater part of the Huzara country, the upper parts of Budukhshan, and some others, but with respect to the more temperate, some circumstances may be stated in modification of it. It is of little importance what phraseology we adopt, provided the facts be kept in mind.

172 Even in Cabul many products of the khureef are actually raised, and probably all might be raised. In the whole of the west of Toorkistan beyond the Oxus, and of Bactria, jooaree is one of the greatest crops in the country, and does not fall short of the Indian either in quantity or quality of produce. We may trace it into the country of the *Kuzzaks* and *Kirghizes*. Maize grows in all but the coldest countries, as well as in India, except that there it is sooner ripe. It has been but lately introduced into Cabul, Candahar, and most other of the neighbouring countries. In those quarters it is raised not to be ground into flour, but to be eaten whole after being roasted. Mash, which includes oord and moong, is a common produce in Toorkis-

tan, parts of Khoorasan and Afghanistan Rice is the chief corn of Kushmeer, and is raised in all but the coldest countries, provided there be a sufficient supply of water, it seems however to degenerate in quality in such countries In the warmer parts of Khoorasan, were there but summer rains as in India, the khureef might be expected to be equivalent to the rubbee Not only can we trace some of the products of the khureef into the moderately cold climates, but we may mark two harvests tolerably distinct in their seed times and their products This may be exemplified by a sketch of husbandry of the valley of Cabul. The great seed time is the autumn, in which are reaped wheat, barley, musoor, and peas, these are reaped chiefly in the month of June, having lain under the snow during winter and been protected by it All of them are sometimes sown in the spring, and this practice is far commoner in Budukhshan and many other quarters, but the spring-sown are cut nearly at the same time with the autumn-sown To this harvest belongs chunna, which is very rarely sown in the autumn, but beans are sown about the end of May and reaped in the end of September, the autumn-sown products, together with chunna, may be said to form the rubbee of Cabul, which is by far its greatest crop. There remains however some considerable products which have different harvests Besides beans, which in India belong to the rubbee, we may mention the two grains there called *cheena* and *kungunee*, in Persian *urzun* and *gal* In India they are scarcely considered as belonging to any season, for by the help of water they may be raised equally well in all The *cheena* however is more commonly cultivated in the rubbee, or rather after it, and the *kungunee* in the khureef. In Cabul they are raised sometimes for fodder and sometimes for their grain. In the latter case they are sown in the beginning of May and reaped in August. Maize and mash are sown a few days later, and reaped in September. Rice, a far more important product than maize, is sown in May and June, and reaped the end of August and September.

173 It is even practicable in this valley, by good management, to gather two crops within the year off the same ground In India the farmer usually contents himself with one crop in

the year, and the rubbee and khureef lands are distinct. In Cabul there is a similar distinction between spring lands and autumn (buharee and tecramahee). A good farmer ploughs his spring lands in autumn, and gives them a red winter fallow, and his autumn lands in spring, giving them a red summer fallow, but where plenty of manure is to be had, he both gives more to his fields and exacts more from them. After cutting his wheat, barley, and other rubbee products, but especially after barley, he ploughs and sows other things which come to their perfection in the autumn. Kungunec and cheena intended to ripen, can scarcely, in Cabul, be raised after wheat, but may be raised after barley, which is about twenty days sooner. In Bulkh considerable quantities of these grains are raised after barley, and sometimes after wheat, for the harvest there is earlier. In Cabul they may be cultivated for fodder even after wheat. The kungunec, when its ear is forming, is eaten down by sheep or other animals, the cheena is reaped in the same state and given to stack. In Bulkh they sometimes raise maize, mash, melons, and garden vegetables and greens, after wheat and barley, but chiefly in Cabul, certain only of these can be raised to advantage in this manner, for the land is there scarcer than in Bulkh, and the farmer studies to draw the utmost from it, the lateness of the harvest and coldness of the autumn often defeat his intention.

174 The grains and garden vegetables just mentioned are, in general, the same which are cultivated in England—carrots, turnips, radishes, cabbages, lettuce, cauliflower, onions, garlic, &c., to these are added some from India. The mothee of India gives but little produce in Cabul. The shukurkund, or sweet potatoe, is not known even in Peshawur. Most garden vegetables are cultivated in spring ground, some in ground lately under rubbee. Melons are commonly raised in spring land. In Bulkh it is customary after cutting barley, to plough, manure, and sow a mixture of mash, musk melons, and water melons, which all ripen in the autumn. In Candahar there is no difficulty in raising the paliz (for that is the name given to a crop of melons or cucumbers) after the rubbee. Great quantities of manure and water must be given to the paliz. In certain places in the

east of Bactria, however, it is lulm raised. Next to their fruits, the natives dwell on the excellence of their paliz, and it forms no inconsiderable object of attention to the farmer, it is most abundant in the neighbourhood of cities; in very remote and rustic parts it is unknown, but they are few. Few things that are cultivated, derive their qualities so much from the soil as from some unknown circumstances. Futehabad, on the road between Jellalabad and Cabul, is famous for the excellence of its water melons, near this place Shujaoool Moolk was defeated in June 1809. All the products which have been mentioned, including paliz, are, in Khoorasan, included under the name *subzbur*, except wheat and barley, which are called *sufedbur*. In Toorkistan, the terms *kupood*, *burgee*, and *sufedburger* are substituted. The distinction is recognized in the revenue system, and the rules of collection from each are sometimes different.

175 The boast of the natives is their fruits. Those of Cabul are acknowledged to be good, even by the Persians, whose country is celebrated for its fruit, and who are generally loth to commend any other. The Cabulees probably lavish too high praises on their fruits. Their pears at least are but ordinary; their apples are inferior to those of Kishmeer, and even they, when brought to India, are not so good as the English or American. It is but just to observe, that the most delicate and luscious varieties of the fruits are not capable of being preserved for exportation, and a foreigner cannot judge of their merits, without visiting the place. The following are the chief fruits of Cabul—the apple, pear, plumb, cherry, peach, apricot, quince, mulberry, pomegranate, almond, walnut, and grape. The fruit called Allo Bokhara, is not here raised, it is quite unknown at Bokhara. The greatest quantities are raised in the district of Ghuznee, whence it is exported, but some are produced in particular places of Khoorasan. The mulberry has been already mentioned, and appears to be a most important object of culture in certain parts of the country, the walnut is cultivated in the neighbourhood of Cabul, but on the whole, it ranks rather as an uncultivated, than a cultivated product. In the valley the season of fruit begins about the time that the

barley is reaping The earliest species are certain kinds of mulberry, the plumb, and a kind of apple called *Jaurisigurina*. The latest fruit are certain kinds of apple, which ripen in the end of September and beginning of October. The apricot is very abundant in Ghorbund The grapes of Cabul are much celebrated, and comprehend many varieties and degrees of estimation, the earliest are ripe in the last days of August. The fruit gardens of Cabul on the whole, occupy a considerable part of the valley, and furnish one of the greatest exports of the country In Khoorasan the fruit is good, but it does not form a prominent object of culture The pomegranates of Candahar are large and good, some are exported The natives of Toorkistan boast of the goodness of their fruits, and probably with justice, but little reaches India The quince of Peshawur is said to excel all others. The place produces no other fruit of remarkable goodness.

176 Hay is known in most of these countries, but not in all places of them. We have already seen that most of the pastoral nations trust the subsistence of their stock during the winter to the withered grass still remaining in the pasturing grounds, even though it have been buried to a considerable depth under snow I have already mentioned the custom of the Hazard Ymaks, and others, of reaping the natural grass of their pastures, to serve as fodder during the winter With respect to the provinces towards India, and formerly part of it, their customs, in this respect, are the same as those of that country No natural grass is reaped for hay, the only exception I am acquainted with in the whole of those wide countries, is the custom in the countries east of the great Indian desert of cutting grass at the end of the rains. A provision of grass is reckoned necessary to enable a town to stand a siege The cultivation of artificial grasses is (I believe) quite unknown in India, but it is very common to sow certain of the khureef products, such as jooarec and moth, with a view to cut them before ripening for the stock When so intended, they are always sown thicker than usual, and called *churee*, put is given green, but more is reserved to be dry food during the cold season. The same custom prevails in Cabul

with respect to cheena and kungunee, as already mentioned, (see paragraph 172), but what corresponds to our clover and hay is the rishka and shufteer. These plants are found in a wild state in many parts of these countries, as has already been mentioned (see paragraph 124). The shufteer is an annual, or at least is cultivated for only one year from the same seed, it is generally sown in the autumn. The first reaping is, in Cabul, about the 30th of April, and it may be cut again twice or thrice during the course of the summer and autumn. It is little cultivated in Khoorasan. In the district of Huat, it is sometimes ploughed in, without having been once cut, to serve as a preparation for rice. It is scarcely cultivated in Toorkistan, where it is very commonly wild. Rishka seems to be a much superior plant. It is represented as a perennial, and is in fact allowed to remain on the ground ten years, sometimes fifteen. It is cultivated in Cabul and all the countries west of it, but both rishka and shufteer are unknown in Peshawur, they require much watering. Rishka is generally sown in the spring.

177 A custom little known in India is, that of cutting what are called khuseels. By this is meant the cutting out the leaves of wheat or barley, before the stalk has risen, to be given to horses or cattle. In Peshawur it is thought that barley may be thus cut twice, or even thrice, with little or no injury to it, but wheat is more delicate in this respect, and many condemn the cutting even one khuseel of it. In Cabul no khuseels are cut, and perhaps the custom is pernicious in that climate. It is very common to eat down by cattle, the young leaves of the wheat and barley in the autumn or beginning of winter. In the Kuchhee of Mohummud Khan, both customs prevail, and the cutting of khuseel is common in most parts of the Sikh country. When a crop is likely, in the Punjab or Peshawur, to turn out an indifferent one, or when danger is apprehended from military violence, the farmer sometimes thinks it advisable to cut it down, even when the ear is formed, as a khuseel, and instead of it to sow some other product. Khuseels, in the sense first explained, are cut in all provinces of Persia, they are thought to be a good food for animals.

178 The rubbee of India and of the warm provinces of the

Afghan monarchy as far as the hills to the west, is almost invariably autumn-sown. In our upper provinces, the month of October is the best month for sowing, and that in which most is sown. Moderate rain before sowing, or in lieu of it, one watering, is favourable to the future crops, but not reckoned indispensable. In the neighbourhood of Peshawur, the owners of lands capable of irrigation never fail to give one water before sowing wheat or barley. This is called in the local dialect *tleap*, and is not considered as included in the number of waters commonly said to be given to these crops. Beyond Jellalabad there is not the same uniformity of practice with respect to seed time as formerly observed, all the products of the rubbee are, in Cabul, occasionally sown in the spring, and cheena is always so treated. In Ghobund the whole of the barley is spring. In the district of Ghuznee there is on the whole more spring corn than winter. In Budukshan the barley is generally spring, as well as a part of the wheat. In the whole of Toorkistan and the greater part of Khoorasan, the whole of the cheena is spring. In Candahar it is true most of it is winter, and spring corn is but little known in that district, but in the country of the Hazaras, except the most temperate parts, all the crops are spring, the same is true of the most lofty parts of Budukhsan, Durwar, Keerategin and Wukheeha, the Pamer, a considerable part at least of Kashkar, and all the Tibets. From the last, the custom has spread to Kushmeer, but the rubbee there is inconsiderable. It will be found in most cases true, that the greater the cold of the place, the less of winter crops, another rule usually holds, that where the lands are irrigated, there is more winter corn, and vice versa. The chief reason assigned is, that hulm crops sown in the autumn are subject to be hurt by the frost; but the owner of irrigated lands can protect his young crops from its rigour, by watering them. This water is therefore called *yukhab*, in Persian. In Keerategin alone, the rule is reversed under peculiar circumstances.

179 In our upper provinces, the harvest of wheat and barley is in March and April. It is observed that the south-east is earlier than the north-west, but the difference is not considerable. The rule however holds good in our further progress to

Peshawur, and between the harvest of that place and of Delhi there is at least one month. On the 20th May, there was wheat still uncut in the valley of Peshawur, Bajour, Koonur, Jellalabad and Lughman are somewhat later. It is a common saying in the country, that the rubbee comes from the east (that is, begins soonest in that quarter) and the khureef from the west. The latter fact it is not difficult to explain, for the khureef here meant, is the Huramee khureef (so called in the country) which is sown in the end of May, or earlier, and is artificially watered. The causes of the former fact deserve our attention. They seem to be the following 1st, As we proceed north-west, the heat of climate declines, and crops ripen a little more tardily 2nd, To the west the periodical summer rains become later and later, and hence the seed time, and as depending upon it the harvest of the khureef, is retarded, which has a natural tendency to retard the seed time and harvest of the rubbee 3rd, A great proportion of the rubbee is sown on low lands (see paragraph 166) The consequence is, that the seed time must be deferred until these lands become capable of tillage, by losing a portion of the moisture they have gained during the flood of the rivers and the periodical rains. In the second place, crops sown on such lands are later in ripening than the crops of higher lands.

180 All parts of the valley of Cabul are not of the same temperature, and in the ripening of crops on soil and exposure, June on the whole is the harvest month. Ghuznee is some days later than Cabul, and the Hazara country considerably later than Ghuznee. In Seatsung of the Hazaras the harvest is in October, and snow sometimes falls before it is gathered. Candahar is a little later than Peshawur. Bokhara seems equal with Cabul, and the harvest of other places may be calculated with tolerable exactness, from the temperature. The Pamer however is very early. The Kirghizes during their visits to it in the summer, cultivate some wheat, barley, and cheena. There wheat though later sown than the little spring wheat sown in the dominions of Bokhara, is sooner ready. We may here notice a curious circumstance with respect to the corn of the highest countries. The wheat of Tibet, the Pamer, and the Hazaras, is

bearded like that of India, but the barley (especially of Tibet) is unbearded. Not less singular is that species of barley well known in Persia, in Mushhud, Goonabad and some other parts of Persian Khoorasan, under the name of *joutoorsee*. That part which is intended for seed is given to horses, with such precautions as prevent its being trituated, and thus losing its vegetative power in the body of the animal, when afterwards sown in the spring it comes to perfection in sixty days.

181. The scythe is unknown, and crops are reaped by the sickle. Wheat and barley are, in Toorkistan and most other quarters, separated from their straw on the field. In Cabul the straw is reckoned equal in value to the grain, and to prevent its dissipation, most farmers carry the crop after reaping and drying to the farmstead and there separate them. In these countries, as in India, the rubbee crops are trod out by animals, not thrashed, to these there are few exceptions. In Kushmeer the labour of men is cheap, and there all crops are separated from their straw by being beaten with sticks. I recollect to have heard of the flail being somewhere used. The methods of preserving corn are various. In Toorkistan the most common practice is to lodge it in *juts*, which locally they call wells, but in Tashkund Week-kheeha, and Keerategin, *kundoos* are commoner. These are well known in Hindustan, and are made above ground of mud and straw. In such are lodged a great part of the grain of Cabul, Ghuznee, and Khoorasan, but in cities, granaries belonging to individuals are upon a much greater scale. Many of the Dooranees have considerable stores of former years lodged in their houses. This resource secures that country from even the chance of a famine, and famines are rare in any part of the countries in question, the most common cause is the devastations of locusts.

SECTION II — *A Review of the Districts.*

182. In the following review of the districts, I shall altogether omit some considerable spaces of country which have been mentioned under preceding subjects. The late embassy in Sindh must have procured information respecting the Tal-

pooree dominions, much preferable to any I can offer. During our inquiries we have always experienced great difficulties in gaining just and consistent accounts of Bulochistan, and I have learnt that government have lately received some information respecting that country, on both accounts I intend passing most of it in silence To the south we begin with Keharapoor, and the line between it and the neighbourhood of Candahar In my opinion there is no other line with which it so much behoves us to be well acquainted, and I therefore feel the greater regret, that the information yet obtained regarding it is so unsatisfactory The country immediately north of it, constituting the southern part of Afghanistan, is still more obscure, and there are certain places, the routes between which we have never been able to obtain In the account of Candahar, something will be said of the Dooranee country and Seestan With respect to Persian Khoorasan, it will also be mentioned, though very briefly We have to regret that our information is often the most scanty concerning those countries whose position and other circumstances render them most interesting in a public view To the north I shall omit the Punjab as far as the river Hydaspes, as being little different from many provinces of India, and because of information already obtained of it

Four Tuppas of Cabul

183 The rubbee is the greatest crop, and according to our way of speaking, the only one (see paragraphs 171—3) Wheat is the chief product, and after it barley The poorest classes consume a considerable proportion of barley and peas in their food There are none so poor, but that they occasionally indulge in animal food, and the rich in a great measure subsist on it Corn is imported even from the environs of Ghuznee Rice is brought from upper Bungush, Jellalabad, Lughman,

in the southern parts of the valley and its skirts ; some is brought from the extremities of the Hazara country From Toorkistan are brought sheep, but seldom either ghee or lambs. From the Hazara country come considerable numbers of sheep. In the spring, lambs are had from the Ghiljies Horses and ponies are imported from Toorkistan, but some are fed up in the valley. The people drink from streams, but those of the city in part use wells Fuel is brought to the city chiefly from the south ; the chief supply of timber is from the mountain Kul-kucha, three days to the east of Cabul. In the valley itself there is a good deal of cultivated wood, being that of fruit trees, willows, and sycamores. In Kohistan there is abundance of natural timber, but it is not required. The orchards of this valley, which are very numerous, are chiefly in the Kohdamun, and in it the valley of Irtalif is much celebrated for the excellence and profusion of its fruits, and also for its picturesque beauties ; still the most interesting object to the people is tillage. The chief pasturage is in Logur and the south, as also towards Ghorbund. The Tuppa of Bootkehak is that in which agriculture is most pursued In the whole valley the watered lands much exceed the unwatered, but in the southern skirts there are some small spaces in which the reverse is true. Fodder is scarce and dear in Cabul, and most parts of the valley ; artificial grasses constitute a considerable part of it in those quarters where pasturage is much pursued. A part of the population live under tents, in summer but otherwise houses are used, and the most common kind is the flat, roofed. In Cabul, which is a close built town, house rent and ground rent are very dear. The chief live stock is in cows, except where pasturage is followed, and there sheep are a more important object. A considerable trade is carried on by the Cabulese, especially with Toorkistan and Hindoostan, the late distractions have thrown obstacles in the way of trade, but otherwise little affected the prosperity of this city and district. The population of the city may be guessed at 60,000 souls ; the villages are various sized, and on an average may contain 150 families ; they are not fortified, but invariably contain small castles or private forts, of very contemptible strength. There are few wastes or spaces ill supplied with

water in this district, such as do exist are towards the southern and north-western limits. With respect to carriage, bullocks are chiefly used within the valley; those who trade to Koora-san employ a majority of camels, goods taken into the Hazara country are carried on mules and ponies; the Ghuljies who trade to Toorkistan by the road of Bameean use camels. In the trade to the eastward, including all quarters, equal use is probably made of camels on the one hand, and mules and ponies on the other

Ghorbund.

184. This is but a small district, and on the borders are large tracts which are merely pastured; but except the waste called Regrawan (see paragraph 99) there is no considerable space where the water of springs or streams is not to be had. A great part of the district is hilly, and though the hills be often of a tame character, some of them yield pine. The houses of the district are flat-roofed. In the summer a part of the population live under black tents. The pasturage is very important, but still the chief subsistence of the people is from agriculture. There are very numerous orchards, and the chief fruits are apricots, almonds, and grapes. Raisins are brought from Ghorbund to Hindoostan. The chief cultivation is along the stream of Ghorbund, and of course the proportion of lilm is very inconsiderable. The chief product is wheat, and after it rice, notwithstanding the coldness of the climate; after rice is barley, which is chiefly spring sown, there is little palez or maize, nor are pease much raised. Wheat, sheep, the ghee of milk, and that of doomba fat, are exported to Cabul, and of course provisions are cheap. The people, who are not very numerous, live much at their ease, and the climate is healthy. The Kheshees, a small tribe of Afghans who reside here, carry on some trade between Cabul and Toorkistan. Grass in the summer is very abundant. Some rishka is also cultivated for the wants of winter. The chief live stock is sheep, but their cows are in a considerable proportion. The pasturing people breed some horses, chiefly of a small size. Within the district the chief carriage is probably on ponies. For fuel they burn shrubs and

sometimes the branches of trees, and they drink the water of streams and springs. The chief village of the district, which is called Ufzul Khan, may have 200 houses, all the others are much smaller

Kohistan of Cabul

185 The term *Kohistan*, when used by the Cabulese especially, is seldomer applicable to a hilly country in general than to that mountainous space which lies north of the valley of Cabul, every valley in it has its stream, and there are many springs among the mountains, timber too is plentiful, and in the summer, grass. The inhabitants chiefly subsist on mulberries, and after them perhaps their grain and their live stock are of equal importance. I know not that any of the tame animals can be said to be the favourite stock. Of grain, wheat is most cultivated, and after it kungunee and bailey. Some grain is imported, especially from the Kohdamun, and the returns are made in cheese, which is here very good, and cotton, a product we would not have expected in a country so cold. On the whole, however, there is but little trade internal or external, and the people live much to themselves. The country is strong, and at times refuses revenue. The people live in flat-roofed houses, and those who attend the live stock to the mountains in summer do not use tents. The villages are small but numerous, and though the surface under the plough be little, the population is not inconsiderable. Wheat and barley, with very few exceptions, are autumn-sown and watered

Jellalabad.

186. This district is very diversified, and many of the following observations are not true when applied to certain parts of it. It may be said to begin in the eastern quarters, near Umburkhara, in the vicinity of the Markoh or Bedoulut, to extend west to Nimla Kuja, a town of the Khogeeanus, a tribe of Afghans, is within the revenue division, and being situated nearly on the crown of the range of 34°, which is here moderately high, is a cold place. The other towns and villages, with but few exceptions, are in a warm climate, and there are

two crops in the year, as there are in Kuja also. The chief subsistence of the people is from tillage, but they have considerable herds of cows and buffaloes.

It may be observed, however, that in these countries the keeping of both these animals depends, or is supposed to depend, on agriculture. In the winter great flocks of sheep pasture in certain parts, but they do not belong to the inhabitants of this country, but to the Ghu'jies to the west. The khureef is the greater crop, and in it, rice, but the quantity of maize is also considerable. The wheat, barley, and maize are nearly equal. A part of the wheat and barley are raised in autumn, and some is spring sown; all the khureef is irrigated except it be some jooaree, which is raised for green food; that plant is not cultivated for its grain in any of the districts north of the range of 34°, and bajra is not to be seen. In Jellalabad the quantity of chuna is very small. For watering their lands they use living streams, and in certain parts rills from springs. There are no kahrezas, or dams, but in some quarters khwurs are turned to account. Wheat is imported from Bajour into the town of Jellalabad, which may contain 10 or 12,000 inhabitants. To Cabul is exported sugar and cotton, some apricots and pomegranates, the pomegranates of Kuja are much esteemed. Cabul returns chiefly dried fruits. Jellalabad lying on the road from the east to the west, certain of the inhabitants of its villages subsist by the hire of mules and other animals; and the supplying of provisions to travellers of all descriptions is an important object. Fodder is in general but moderately plentiful. For fuel they burn dung, shrubs, and those along the river, drift wood. The chief supply of timber is from the white mountain, and others connected with it. The houses are flat-roofed. In the villages they drink from streams or springs. In the town there are also some draw wells. There is little fruit compared with the countries to the west, and if we subtract the transit trade, the district carries on but little traffic. The inhabitants are few who use tents in any season of the year. Their villages are small, and there are considerable tracts, both hill and plain, without cultivation, and some of these without water. Bullocks are the chief carriage within

the district, and in its intercourse with others, perhaps mules are most used.

Gundumuk—Ishpan—Khingul—Tugao, &c.

187. By means of these names it is intended to designate that space of country which lies between Cabul and Kohistan to the west, and Jellalabad and Lughman to the east, being itself bounded to the north and south by two great ranges of mountains or their branches. It is very diversified, and its importance is not sufficient to justify the lengthened details requisite for fully explaining the nature of its various parts. A very great part of it, or its borders, is uncultivated pasture, chiefly hilly, there are few considerable spaces destitute of water. The villages are generally small, but there are some large ones. The population of a given surface is greatest in Tugao; Khingul and Tugao belong to the Safees, a tribe of Afghans formerly more numerous than now, and lie to the north. South of them, in the present tract, are Ghiljies and some Khogeeanus. With the exception of Tugao, the khureef is the greater crop in this tract, and of it, rice and mash, and quantities of these are exported to Cabul. The rubbee harvest being here earlier than in Cabul, a portion of the crop is sold in that city to great advantage immediately before the harvest commences in the valley. With respect to the fixed inhabitants, agriculture is more important to them than pasturage, and cows are their chief live stock; but as the wandering Ghiljies from the west pasture their flocks here during a part of the year, it is a matter of doubt whether the district is to be called an agricultural or pastoral one. The numerous flocks of the Ghiljies consuming the grass, fodder bears a considerable price, especially in the cold part of the year, but in Tugao it is cheap. The natives live in houses which are flat-roofed, and timber is easily procurable in most situations, as is fuel from shrubs or branches of trees, and they drink from the numerous springs and streams. Provisions are cheap, but it is to be remembered that the population is small. Some sheep are bought from the Ghiljies. Besides provisions some pomegranates and other fruits are sent to Cabul before they come in

season there, and this district is distinguished by making a little silk. The crops are irrigated with few exceptions, and the quantity of rubbee, which is spring-sown, is but little. Within the district bullocks are the chief carriage. The climate is different in various places, but on an average is a temperate one.

Lughman

188. Nature has divided Lughman into two districts,—the hilly, inhabited by Ghiljies, and the plain, inhabited by Lughmanees, a race of Indian descent. In both however there is abundance of water, timber, and fuel. The houses are flat-roofed, and the people drink from streams, or in the hilly tract from springs. Among the hills, black tents are used by some of the shepherds in summer. The temperature is much milder than in the Kohistan of Cabul; the country does not appear to be strong. The term Kohistan without the addition of any other to explain it, is not applicable to the hilly part of Lughman. Both there and in the plain the khureef is the chief crop, and rice the chief product. Among the hills maize is the next important to rice, but very little is raised in the plain, where, in its stead are raised sugar and cotton. In either quarter the quantity of wheat is but little, and barley is scarcely raised at all, rice straw being the chief food of the horses. Their horses are not numerous, and they have no camels. Within the district the chief carriage is by bullocks, among the hills the chief stock is perhaps goats, and after them cows, but in the plains the chief stock is buffaloes. Almost all the lands are watered, and chiefly from streams; the climate of the plains is accordingly moist, and agues common. The little rubbee raised is almost invariably autumn-sown. The cultivation and population are considerable. To the west however is an extensive waste, being a plain with small hills, and yielding little water, it is called the plain or desert of Shytan-goom. There are some large villages which may have 800 houses, but in general they are small. There is little fruit, and the chief trade is in rude produce. Wheat is imported from Bajour, ghee and sheep are brought

from the Ghiljies during their annual visits to the low country, when some of them pasture on the skirts of this country, and others pass through it. Sugar, cotton, and rice are exported to Cabul.

Koonur

189. Koonur is an agricultural country, though there are certain dependencies of it to the north-west which are perhaps pastoral, but they are of little account. The chief crop is the khureef, and the chief produce rice, part of which they export to Cabul, the country of the Upper Mihmunds, which lies east and south, and some other quarters. The population is considerable along the banks of the river. The capital, which is called Pushut, is equal to Jellalabad, and there are some large villages; but generally speaking the villages are not so large as in the plain of Peshawur. Into Pushut they import some wheat from Bajour. Ghee is brought from Deogul, and other hilly dependencies to the west of the river, sheep and goats from Bajour; but provisions in general are sufficiently cheap. In the valley cows are the chief stock, and after them buffaloes, the chief carriage is by asses. Fuel, fodder, and water are plentiful, and timber is procured in abundance from the west side of the river. There is also some pine in that part of the Upper Mihmund country which borders on Koonur, and in which the Syyaed of Koonur has influence. The people live in flat-roofed houses, and never use tents. Their fields are almost all irrigated, and their wheat and their barley, which are not great crops, are autumn-sown. The wood of the olive is much burned.

Bajour.

190. This also is an agricultural country, and cows the most important live stock; yet the pasturage, and number of sheep and goats is considerable. There are no black tents used; in many cases however the shepherds pass the summer under what are called koodies, which are made of mats supported by wood. These are erected at what the Afghans call bandas, which are pasturing stations remote from the village, and at them

is sometimes a few acres of cultivated ground, but no inhabitants in winter. This however is not the only meaning of the term. The fields of this country are generally *lulm*, though the quantity of irrigated is still considerable, part of the *lulm* has the advantage of water from *khwurs*. Wheat is a chief product, and in ordinary years more than a maund and a half of Delhi may be had for a rupee, and the exportation is considerable. The northern part however does little more than supply itself. It does not appear that any sort of provisions is imported into the country. The quantity of sugar raised is very small, and that article is imported chiefly from Jellalabad in return for wheat. Fuel, timber, and fodder are sufficiently plentiful, especially in the hilly parts, and water is every where near, the people drinking from springs and from streams; there are few wells. A certain shrub, by the Afghans called *turkhi*, is the chief fuel. Nawangee is perhaps the largest town, Bajour itself being much declined, and the former may be equal in population to one-half of Pushut. The villages in general are small or ordinary. On some of the frontiers are considerable spaces without fixed inhabitants, and the centre of the country is not so well peopled as the plain of Peshawur. Bullocks and asses are most used in carriage, and there are not many horses in the country. The wheat, ghee, and honey are good, and iron is one of the exports from the northern parts.

Kafirs.

191. This people live in a very rugged country, with numerous streams and springs; from the latter they drink, and also water their fields, which however are of little account. They derive their subsistence from their flocks of goats, which seem to be of a species superior to others known in these countries. Their cows and sheep are perhaps in equal numbers; wheat far exceeds all the other grains they cultivate; it is sown in the spring, and watered. Fuel and timber are plentiful, and their houses are constructed of wood. Some of their villages are large, containing 3,000 inhabitants, and on an average they are of an ordinary size, they are not fortified, but are situated in places difficult of access. They do not use tents in any season of the year, but

sometimes shelter themselves in caves. Within the country there is no traffic, but they exchange their ghee, cheese, goats, and vinegar for rice, cloths of various kinds, axes, but chiefly salt. Every thing is carried by men, and there is no camel, buffalo, mule, or ass in the country. They make wines and vinegars, both much esteemed, from the grapes of their own country, which are partly wild and partly cultivated, and uncultivated walnuts are abundant. This country can neither furnish supplies, nor be crossed by troops, except with the utmost hazard

Punjkora.

192 The people subsist by tillage, their chief crop is the rubbee, and the greatest product, wheat; after which, barley. A small quantity of grain is imported from the valley of Buroul, which is in the northern part of the country of Bajour, but has its own chief, who is a Turkulanec. In Punjkora the hulm and irrigated lands are perhaps equal. The latter depends on springs and streams. But little wheat and barley are sown in the spring. Cows are the chief stock, but according to others, buffaloes, goats too are numerous, but sheep very few. The chief carriage is by bullocks and asses. The trade between Peshawur and Yarkund for the most part passes through this country, and Kasin Khan, the chief of Deer, which is the capital of it, and may have 500 houses, levies taxes on the merchants. The other villages are generally small, and some hamlets among the mountains have but five houses, or less. The mountains yield pines, which serve for timber and fuel, and also for torches. The mountainous parts are very thinly peopled, but that part of Punjkora towards the Ootman Khel and lower Swad is very populous. Tents are not used in any season of the year. Fodder is plentiful. There are few horses in the country.

Upper Muhmunds.

193. This is a hilly country, and its hills though not high, are often very rugged. Some of them yield pines, but more commonly they are covered with shrubs. The houses are sometimes thatched. The natives in general live in houses, but some tribes have black tents, and the same use is made of

koodies as in Bajour, and to a greater extent. On the whole this is an agricultural country. In some places sheep, in others goats, are the chief stock. Asses are numerous, and are the chief carriage, next to which are bullocks. In many villages a horse, mule, buffalo, or camel is not to be found. Timber on the whole is scarce, but fuel is plentiful, and there is no want of fodder. Some corn is imported from Bajour, Koonur, and the Dooab of Peshawur. The chief return made is in mats, which the natives manufacture from the Putha shrub (see paragraph 129.) From certain parts good ghee is exported to Peshawur. The fields are generally hulm, and the chief product wheat. The two crops are nearly equal, but perhaps the rubbee is the greater. The natives drink from tanks, streams, and springs. There is much hilly waste, of no use but as pasture for goats, and in some cases water is scarce. With very few exceptions the villages are small, and the population on a given surface cannot be great.

Ootman Khel.

194 This country is more difficult than even the preceding, which however it resembles in many particulars. It has more timber, its hills producing pine, and water is more plentiful. The chief subsistence is probably from the keeping of goats, and wheat the chief product. The villages are small, but if we believe the received accounts, the population is not inconsiderable, for this tribe is never rated lower than 10,000 families. They have never paid revenue, and have little amicable intercourse with their neighbours.

Khybur.

195. This is a rugged and unproductive tract, lying between Jellalabad and Peshawur. The natives live by tillage, the keeping of goats, and robbery. Water in many places is scarce, and no pines grow on the hills, which are nearly of the same temperature as those of the Upper Mikhmunds. Fuel is plentiful, and there is sufficiency of grass, fresh or withered.

Teera.

196 This is an agricultural country, though goats be very numerous. The two crops are nearly equal, and on the whole,

the production is equal to the consumption. The houses are flat-roofed, and built partly of stone and partly of mud, no tents are used at any season of the year. The inhabitants are of the Afreedee tribe. West of them are the Shinwarcees, in whose flocks are a greater proportion of sheep than among the Afreedees, and some of them live at times under black tents. Teera yields considerable quantities of good honey. The villages are small. The Afreedee tribe may be conjectured to be 55,000 souls, part of them live in Khybur, and that subdivision which is called Adum Khel live towards Kohat, and the northern Khutuks inhabit the continuation of their hills. Their country answers in most particulars to the description already given of that of the Upper Mihmunds

Peshawur

197. The plain of Peshawur is an agricultural country, and no space of the same extent in the Cabul dominions is equally cultivated or peopled. Upon the whole the khureef is the chief crop. In the plain of the Mundars the rubbee is the chief, and the like is true of that portion of the valley which the Khutuks possess. Perhaps maize is the chief crop, and it certainly is so in the vicinity of the city. The flour of maize is generally cheaper than that of wheat, in the proportion of at least three to two, and a certain mixture of it in the latter is supposed to improve it. The maize of Peshawur is remarkably white, and much esteemed. The rice of certain villages is exported to great distances, but the consumption of this article in that part of the valley which is subject to the king, is partly supplied from Lower Swad. In the same manner great quantities of wheat and some other articles of provision are brought from the country of the Mundars. The valley generally considered, does not support its own population, for the exports are inconsiderable, compared with the imports from Bajour, Chuch, Pothwai, and Kohat, especially the two former. Contrary to what is generally true of India, the khureef is commonly watered, and the rubbee commonly lalm. The watered lands depend on streams much more than wells. Jhulaits are used in part by the Daoodzyes and Mihmundzyes. A severe drought is

inconvenient even to the holders of irrigated lands, as the Bard dries up unless showers fall from time to time, and a level lower than ordinary in the rivers, subjects the farmer to extraordinary labours. In the memory of people living there have been two severe dearths occasioned by the failure of the spring rains, and the calamity was increased by the resort of people from Chuch, whose dependence is on the spring or rubbee crop, cultivated lulm. The quantity of rice and wheat does not fall greatly short of that of maize. Chuna is raised in only one village, and horses here receive barley. Several grains well known in our provinces, among which the raggee, are not here to be seen. Jooaree is cultivated only to be cut green for the use of animals. Provisions are dearer than in Cabul, but fodder and fuel are cheaper. Lodging is very cheap in the town. On the whole, an army could be more easily maintained here than in Cabul. In the city they drink from wells, but in the valley in general they drink more from streams. Some of the Mihmunds and Khutuks have tanks, and near the foot of hills the natives use springs. Although the valley produces little timber, abundance is floated down from various quarters by water, and the wood work in the city is of pine. The city may contain 70,000 inhabitants, and is considerable. Of late it has declined, which has been owing rather to tyrannical proceedings, than to the decline of the government. The few wastes in this province are chiefly in the south-eastern part. Generally speaking, it is equal in cultivation to the good parts in India. The villages are about the same size as in the valley of Cabul. For carriage various animals are used, and the chief live stock is cows and buffaloes. In some places they burn cow-dung, in others, shrubs and the branches of trees, among which the olive is one

Swad

198 The lower part of Swad is included in the valley of Peshawur. It is a rice-bearing, well-watered, and well-peopled country. Upper Swad is mountainous, but yet tolerably well peopled, and there too the chief product is rice. Fuel, timber, especially that of the pine, and fodder, are abundant. The

chief stock is cows and buffaloes. The khureef is the chief crop, and tillage the chief source of subsistence. Cows, buffaloes, ghee, and rice are exported in return for indigo, coarse cloths, and manufactures.

Bhooner

199 This too is an agricultural country, but grain is imported from other quarters, and the populousness is less than in Swad. The chief grain is raised to be kunganee, and hulm is more common than irrigated land. Many of the villages are large, but there are extensive tracts among the mountains without inhabitants. The mountains produce pine in abundance, and of course timber and fuel are easily procurable, but their natural verdure is said to be inferior to that of Upper Swad. This country is seldom visited, and the natives are very rude.

Pukhlee

200. In Pukhlee agriculture is more important than pasturage, and the khureef is the chief crop. Rice is the chief product, and after it wheat. The produce seems to be about equal to the consumption. Most of the lands are irrigated from streams. The natives generally drink from springs, and live in flat-roofed houses. Timber, fuel, and fodder, are sufficiently plentiful, and ghee is very cheap. The chief stock is cows and buffaloes. Their sheep are of the light-tailed kind. The population is considerable, and the villages are of various sizes. There are certain districts individually of small account, commonly included in the revenue divisions, of which the above observations may not always be true.

Chuch.

201 This is an agricultural country, and of remarkable fertility. The khureef crop is of very little account. The rubbee is almost all hulm, and the chief thing cultivated is wheat, of which great quantities are exported to Peshawur, besides some other provisions also supplied. The few fields that are irrigated depend on wells, but the farmers are seldom at this expense except for raising tobacco, sugar, and other products of great value. They drink from wells, and some from tanks,

or the river Indus. Timber is rather dear, and therefore part of their houses are thatched. Their chief fuel is dung. The largest villages may have 350 houses; the others are much smaller, but they are numerous, and the population is considerable. Cows are the chief stock, and bullocks the chief carriage within the district; but for external trade mules are more used. The trade from Kushmeer to the west passes through this district, which also lies in the great road from Hindoostan to Peshawur and Cabul.

Huzara

202 This is a small district, unworthy of much mention. Tillage is the chief subsistence, and the chief products are said to be wheat, barley, and mash. It has some streams from hills, and the amount of irrigated lands is equal to the hulm. Sheep are perhaps the chief stock. Provisions are not so cheap as in Chuch, and there are more wastes. The villages on an average have 80 houses. The natives drink from springs, rills, and tanks, and their chief fuel is shrubs.

Moozuffurabad

203. Concerning this district, I have gathered but little, nor is it of much importance either from its produce or position. The cultivation is but little, and is irrigated. A little wheat is imported, and a little rice exported. Timber, fuel, and grass are easily procurable. The live stock is various, and the chief carriage, at least to Kushmeer, is on the backs of men. The pasturage is important.

Kushmeer

204. This celebrated valley is admirably watered by streams and rills, which seldom fall below a convenient level. The quality of the soil is excellent, and adapted for the culture of rice, a grain which supports a great population; and the inhabitants are industrious and frugal. Very little of the produce is expended in the support of animals. There are few countries of the same extent so populous as Kushmeer. The capital cannot have less than 100,000 inhabitants, and is decidedly the largest city

in the Cabul dominions On the mountains are fed numerous flocks of sheep, which are here a very valuable stock, yet are cows, on the whole, kept to a greater value There are no buffaloes or camels. The chief carriage within the valley is by boats, and with most of the neighbouring districts by the labour of men The quantity of rice produced far exceeds all the other grains and articles of food. A Kushmeeree eats wheat as a curiosity That, like all other things, is sown in the spring Saffron is cultivated lilm, and some of the gardens receive no water The fruits and the pale/ are inferior in quality to those of Cabul, and the rice is of a coarse kind, but productive Flesh is dear, timber and fuel cheap. The produce seems to be equal to the consumption and no more, nor could Kushmeeri be easily made to yield supplies to an army not quartered in it, for the access is difficult, and carriage expensive. Fodder is plentiful, and especially rice straw, with which many of the poor thatch their houses; but in general the tops as well as the walls of the houses are of wood. The natives are proverbially unclean The trade of Kushmeer is great, and already well known in Europe.

Rajwer, &c

205 The southern dependencies of Kushmeeri are well watered vallies, of which the chief produce is rice and maize, and the chief live stock cows and buffaloes. Wood and fuel are abundant, and the houses, whether of stone or wood, flat-roofed with timber Provisions are cheap The villages are small, but numerous in the bottoms, though there be much uninhabited space among the mountains

Pothwar, &c.

206 Pothwar has a sandy soil of very poor quality, but a portion of all the three rains. Wastes are to be found, sometimes stony, sometimes broken ground, but on the whole the quantity of ground cultivated may excite surprize. The chief crop is the khureef, and bajra the bread corn of the people The grain gives but a small produce on a given surface There are some towns, but villages are small. Wood is dear, and part of the houses are thatched, part flat-

roofed. Some horses are bred here, and the number of live stock is considerable, so that fodder is dear. Grain is sufficiently cheap, and a small quantity is exported to Peshawur, to which they also send ghee. They and their live stock often drink from the same tanks. The number of small tanks is very great, and there are some wells in low situations for drinking. The few lands that are irrigated are chiefly watered from wells in hollow places, and are under tobacco, garden vegetables, and other valuable cultivation. Rice, sugar, maize, and chuna are scarcely cultivated, and more barley is raised than wheat. The chief fuel is cow dung, and the chief carriage, bullocks and mules. Though I have little detailed information concerning the remainder of this Dooab, to the south as far as the dominions of Mahmood Khan, I conceive that it answers in most particulars to the character now given of Pothwar.

Ghuznee, &c

207. In this country the chief subsistence is from tillage. At the same time the pasturage is important, and being more mentioned in the neighbouring districts, the inquirer at first is led to suppose that it is the chief object. On the whole sheep are certainly the chief stock, but in some well cultivated parts cows are kept to a greater value. There are no buffaloes. The chief carriage is by camels. The quantity of khureef raised is very inconsiderable, and by far the greatest product is wheat, which is exported to Cabul, after wheat is barley, which in general is sown in the spring, in the coldest situations, for example, Khurwar. The wheat also, and indeed every thing cultivated is spring-sown. The quantity of irrigated lands exceeds the hulm, which itself has often the advantage of khwurs; the irrigated lands have water from streams and kharezas, never from wells. The quantity of palez is not very great, and there is but little fruit except in the environs of Ghuznee. The natives drink from springs, rills, and kharezas. Near Ghuznee is a dam still in good preservation made by order of Shah Mahmood Ghuznuwee; it is filled partly by rain, partly by springs and rills, and its water is used in irrigation. For fuel the natives use shrubs, the dung of cows, or that of

Pl 2

*Inscription No. 3 from the feet of Bahu in
(Nagree Character)*

हवेधैर्यम् धर्म्यं¹कुरुनियम्यचक्रतमनिस
 त्वेवयादिकार्यम् अम्बकायपार्वत्यैच ब्र
 ह्मक्रियारम्भेवयोधर्म्यः॥ ज्ञातुरेपायेयंदेयंती
 र्यपरेषु ॥ पत्न्यात्राविरोधेन लब्धोपाप
 क्षेत्रोपरिक्रियाकार्य्यात्याज्या ॥
 कार्य्याधिकारिक याज्ञिकशिक्षकापत्या
 प्रजाधिपलाविनः व्ययेपि ताप पीनका

येमम अणयः चय विक्रयेण

९

क	तु	त	धै	न	ण	प	पा	बो	ब	ब्यो
ka	tu	ta	dhy	na	na	pa	pa	bo	ba	badhoo
क	तु	त	८	७	७	८	८	८	८	८
म	म्य	य	र	र	ल	व	श	ष	क्ष	
ma	mya	ya	ra	ra	la	va	sha	sa	kshva	
म	२	२	२	६	८	८	८	८	८	
च		य	ज					स		
ch		ya	ja					sa		
८		८	८					८		

Inscription at Sinyore in Siam

सिद्धिः॥ संभुज्यभूपएवेत्यंजनितापरभूमिपः

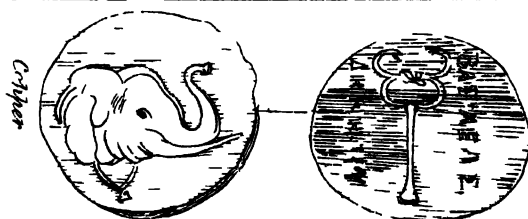
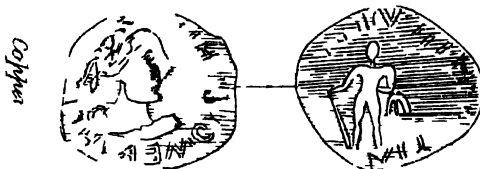
श्रीलषण्णमण्डल्यःश्रीकंदर्पप्रतिष्ठितः

॥ श्रीसीथीचाचा॥ ठकुराश्रीछत्रकः॥ ठकुर

रश्रीनपरकुदुडुल॥ श्रीललरदर पक

क	कु	च	छ	ज	ज्य	ठ	ड	ण	त
ka	ku	cha	chha	ja	gya	ṭ	ḍa	ṇa	ta
क	कु	च	क	ज	ज्य	ठ	ड	ण	उ
प	भ	म	य	र	ल	द	थ	न	स
pa	bha	ma	ya	ra	la	da	tha	na	sha
य	भ	म	७	व	ल	द	ठ	क	म
ष	श्री	ए							
ष	श्री	ए							

Euthydemus Baemeau



Demetrius Baemeau

sheep, according to circumstances Timber is exceedingly scarce, and hence the houses are generally of the vaulted kind A part of the population is in summer under tents, and in winter they flit to warmer climates. Fodder is moderately abundant There are considerable spaces without cultivation, and the population on a given surface is much inferior to that in the valley of Cabul

Jayee

208 This is a narrow valley, and its climate is cold, the stream ultimately joins the Koom. The stream natives mainly subsist by tillage, and the chief products in their order are wheat, barley, rice, and pease The lands are watered. The chief stock is goats. Timber, fuel, and fodder are abundant, and some provisions are exported to Cabul, to which they also send some planks of pine, about six or seven feet long The carriage is on mules, for the nearest road to Cabul (with which they have most intercourse) is not practicable for a bullock or camel, it is called the road Goubund The natives live in flat-roofed houses, and have no tents. The population is but small, and there is no large village

Notice of an inscription in Behar, communicated by MR. RAVENSHAW, as published in the May number of the Journal, 1839

The Editors of the Journal noted (vol viii page 347,) in announcing the communication by Mr. Ravenshaw of certain impressions of very ancient inscriptions from Behar, that "the most important and interesting of these impressions were so imperfect, and confused, as to baffle the attempts of the Pundit Kamala Kanta, who aided Mr. James Prinsep in his valuable discoveries. We allude particularly to the inscriptions on the inverted column in the Fort of Behar."

I have now the pleasure of laying before the readers of the Journal a rendering of one of these inscriptions as decyphered by Pundit Kamala Kanta Vidyalka, and Baboo Hurrinboonath. They succeeded in giving this interpretation after a great expense of time and labour. The characters are of a class

not hitherto met with, and I confess I cannot submit this first attempt to interpret them without considerable diffidence. The inscription is unfortunately destitute of both name and date, and does not, moreover, afford any clue by which the period of its record can be traced. It is however a very singular relic in itself, and the formation of an alphabet from the characters which compose it, may have important results, in leading to the easy perusal of other similar inscriptions, which I am not without hope a more diligent search may bring to light. The ancient history of *Magadha* and *Mithela* may come to be tested by evidence the most valid in the prosecution of such research, unpromising though the first fruits be, historically speaking, of what has been as yet attempted.

I may here, to save the trouble of reference, remind the readers of the *Journal*, that Mr Ravenshaw reports the inscription to have been found on a broken stone pillar, situated in a reversed position a little to the west of the northern gate of the old Fort of Behar its original site was according to tradition, in front of the gate. The following is the translation of the inscription, facsimile of which is given opposite page 65

- 1 Be patient when angry
2. Perform religious sacrifices as prescribed
- 3 Be liberal in religious performances
4. Be charitable to the weak and needy
- 5 Riches should be spent in the celebration of rites in honour of *Siva* and *Parvati*
6. The weak and destitute pilgrims should be supplied with the expenses of their journey
7. Remove difficulties in the way of pilgrimage
8. Exercise no oppression in any acquired (conquered) kingdom.
- 9 Encourage the officers of the state *
10. Punish the oppressor of the (people), high or low.

The above affords little matter for speculation, save as regards

* The Pundit is doubtful as to the interpretation of this phrase

the creed of the person who caused it to be inscribed, who was evidently not a Boodhist *

Nos 1 and 2 (duplicates) of the Behar inscriptions have been for the most part read by Pundit Kamala Kanta, but he is as yet unable to make out their full meaning. The character is not the same with that of No. 3, now published. As hopes are entertained of the arrival of that excellent orientalist, and able antiquary, the Honorable George Turnour, Secretary to Government in Ceylon, at this Presidency before the close of the present year, and as it is believed that he will make a tour through Behar and elsewhere, for the purpose of exploring still further the interesting subject of Boodhist antiquity, I trust to see these remains critically considered by a scholar in every way competent to pronounce upon their æra.

In the mean while, it is our duty to make the most of imperfect opportunities, in order to publish (submitting it to the judgment of able critics) whatsoever casual research has put us in possession of

I may here remark, that circumstances appear hitherto to have conspired to prevent more than a very cursory inspection of the remains of Hindoo monarchy in Magadha (Behar) and Mithela, (Tirhoot and Sarun) Indeed Mr Hodgson's brief, but interesting note of Simrown in the Turace (vol iv Asiatic Society's Journal, p 121) is the only description we possess of that ancient city, while the Behar inscriptions, one of which Mr Ravenshaw's discoveries have enabled me to publish, have been copied in some instances with more haste than was consistent with correctness, and by the specimen now afforded, seem rather valuable as tending to excite further investigation, than as rewarding the search already undertaken. An ample and untried field is opened for inquiry in these regions, and it is sincerely to be hoped that no opportunity may be neglected of engaging in it

* The injunction No 8, with its allusion to a *conquered, and acquired territory*, might by conjecture be assumed to point to Jara Sandha, who having subdued the whole of *Prachi* " (the eastern region) as we read in the *puranas*, fixed his residence at Bali putra " (Wilford, As Res vol v p 281)

In the month of February last, Captain Burt of the Engineers, obligingly supplied the officiating Secretary with the fac-simile of an inscription taken by him at Pinjore; it was discovered there on the side of a well. The character is, as Captain Burt observes, different in many letters from all the alphabets given by Mr. James Prinsep, Kamala Kanta has therefore prepared an alphabet from it (No 4) and enabled me to give the accompanying translation.

“The monarch of Shonder Desh, who resembles Kamdeo in beauty and renown, having again in this manner fully enjoyed, will become ruler of other countries.”

The meaning of the rest is not clear. I have endeavoured to trace the *Shonder Desh* herein mentioned, but ineffectually. The inscription therefore is, like the one above noted, valuable only philologically speaking. The neighbourhood of Pinjore to Phanesur might induce the belief that the region in which it was anciently included would not escape unnoticed in the Maha Bharat

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Account of Coins found at Bameean.—By Captain HAY, 1st European Regiment, Commanding 5th. Regt H. M. S. S. M. Infantry

Bameean, April 7th, 1840.

SIR,

A doubt having been expressed whether “Demetrius” ever reigned in Bactria, the fact of one of his coins having been discovered in digging some trenches at Bameean, may be considered as likely to strengthen the opinion that he did and as this coin I believe differs from the only one of his reign that is said to have been hitherto discovered, I take the liberty to forward you a sketch of it, in case you may consider it worthy of notice. The first “Demetrius” discovered was I think of gold, having upon the reverse the two horsemen so common and beautifully executed on the coins of Eukratides. I take these figures to represent Castor and Pollux, who were entitled, as Hercules is, to divine honours. My coin, which is of copper,

has been well executed, having on the obverse an elephant's head, with a bell round his neck, and without any legend the reverse has what I take to represent a sceptre and ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ This Demetrius (called the handsome) son of Euthydemus, married a daughter of Antiochus the Great; fixed by Bayer 205 B. C

I have also found at Bameean this winter a coin of Euthydemus, the father of Demetrius, but altogether so inferior in appearance to those handsome medals figured in Burnes's work, that it is evident mine must have been struck at a provincial mint, and represents Euthydemus merely as Soter, not Basileus. The letters are badly executed, and it will be observed that the Epsilon is used reversed where in Burnes's coin an Eta is substituted, and the H is used instead of Θ Thus ΕΥΗΓΔΕΜΟΥ

The reverse has Hercules and a Pehlevi legend, which is not sufficiently clear to distinguish These are the only true Bactrian coins that have been discovered since our sojourn at Bameean, and both are in my possession.

As the coins of Antimachus do not appear common, and I do not remember seeing one figured, I send an impression of a very perfect silver coin which I procured from a cafila on its way from Balkh from the same cafila I was fortunate enough to procure a large and very perfect silver Eukratides, which I think has been described in a former number of the Asiatic Society's Journal I have many other coins of Apollodotus, Menander, Pantaleon, Lysius, Ermaios, Spaliriscus, Aros, also coins of the Indo-Sythic series, Kadphiges and Kanerkas, but I fancy all these appear in Masson's list of discoveries, and are by this time I hope under the able description of H. Wilson.

I remain, with respect,

Your obedient servant,

WILLIAM HAY

Note on the above—By the Officiating Secretary

The discovery of the copper Demetrius at Bameean is valuable, as throwing (if the evidence may be taken as sufficiently strong) a new light upon the history of that prince Mr Schlegel (*Asiatic Journal*, vol ii p 408,) in his *Epitome of the history of the later Bactrian kings* has adopted the opinion that, "Demetrius did not succeed Euthydemus in Bactria" He holds that Demetrius governed the provinces situated along the lower Indus after their subjugation by his father Euthydemus the title given him by Justin "*King of India*," favours the supposition Professor Lassen of Bonn, however, in his "*Chronological Table*"* of Bactrian monarchs, notes as follows, "Demetrius succeeds his father in Bactria about (B C) 185," and he assigns the usurpation of Bactria by Lukratides, and the consequent retirement to Arachosia of Demetrius to the year 175, B C, thus placing this occurrence six years after the period noted for it by Bayer (B C 181) The discovery of a coin of Demetrius at Bameean would appear to bear out the Professor's position, viz, that this prince actually exercised regal authority in Bactria in succession to his father

I venture to point out this (apparent) proof to those valued contributors to the *Journal*, who are now in Afghanistan, and to request that they will turn their attention to the elucidation of what has been well termed "one of the darkest parts of Bactrian history" for further investigation of the value of what has now been advanced The coins of Demetrius are very rare, I do not indeed believe that more than five have been hitherto found, and all, (acknowledged as his) but Capt Hay's, have been silver, similar in device to that figured in the *Asiatic Journal*, vol iv P XXV On this copper Demetrius I am inclined to risk a theory as regards a very interesting and hitherto obscure coin, noted (*Asiatic Journal*, vol iv P XXV Fig 4) as the coin of "*Magnus*," a supposed monarch, two of whose coins exist in the Ventura collection "This," says Mr James Prinsep, "is an entirely new name, nor can it be read as a Greek word in its present shape, although the characters are perfectly distinct on the coin, and the style of engraving

NOTE.—The chronological table, with some extracts from Professor Lassen's work, were translated for the Honble Mr H T Prinsep by Mr Piddington I have made arrangements with a gentleman (Dr Roer,) fully competent to the task, for a translation of the whole work, to be published in the *Journal of the Society* It will be highly useful to Indian numismatologists, and as the work, even in the original language is not procurable in this country, I know no better method of making it public than by translation in the pages of that *Journal*, which under our Secretary's able management supplied the Professor with some of the most valuable material for his work

corresponds with the early, and pure Greek types " He goes on to suggest that could "*Mayus*," be read with the third letter as a *gamma* it might denote the union of the office of chief priest with that of king, and identify the holder of the title with Menander, or Demetrius, on the authority of the elephant's head found on the coins of both those monarchs, and prominently exhibited on the one under consideration The exact similarity of the upper Demetrius in the possession of Capt Hay to this coin of a supposed, "*Mayus*," in all except the name of the monarch, inclines me strongly to believe that MAYOY, which in the first-found coin holds the place of the ΔΕΜΗΤΡΙΟΥ of Capt Hay's, is merely a synonym, a title, or attributive epithet, whereby the prince was so particularly distinguished as to induce his contemporaries to mention him, and even allow his coin to be struck, under that appellation alone

Under the strong impression of this idea, I turned to examine the opinion of critics of more authority, and found (Journal des Savans, Mai, 1836,) that my own conception had been anticipated in favour of another Bactrian prince, Apollodotus, by Mons de Raoul Rochette, in a singularly ingenious paper on this "*Mayus*" coin

"Ali," says this able critic, "is extraordinary, and all new as regards this medal, another specimen of which I know not the existence of, nor at least do I know that it has been noted described, or published The workmanship is quite peculiar, and belongs to a Greek æra of some remoteness the form and proportion of the letters indeed unite in assigning to it a manufacture at least contemporary with the reign of Apollodotus The *elephant's head*, being a symbol used on the coin of Menander and Apollodotus, suits the assumption well enough, and in this instance, I observe that *the bell*, which may be seen suspended from *the elephant's head* is a peculiarity presented to us also by the little bronze of Menander, published by me, but (which peculiarity) I omitted observing on it In making up for this omission, I would say, that *the bell* is always seen, even on Roman denarii, hung to *the elephant's head*, which forms one of the symbols of the Cæcilia family, nor need I except the similar head, serving as ornament to the Macedonian buckler-symbol on the coins of Metallus Macedonicus This peculiarity which escaped Eckhel, has been carefully brought to notice by M Cavedoni

"But the circumstance of most importance offered by our medal, one which makes it a sort of numismatic problem, is the legend, the name of *the king Mayus*, of a form so foreign to the Grecian language inscribed on so purely Greek a relic,—a name elsewhere so completely unknown, the place of which we know not how to establish by the aid of

any reference furnished by history, in its proper order in the series of kings of Bactria. Perhaps even one might almost doubt whether this medal does form a part of Bactrian numismatics, as the symbol of *the elephant*, found on the coins of the kings of Syria, does not afford of itself means for determining the matter, and that conjecture, when the subject be but one or two medals, is a still more insufficient index. The absence of a Bactrian inscription on one of these medals, almost all bilingual, would be again a reason sound enough to doubt its belonging to the same numismatic family. In spite of this, I think I recognize a Bactrian medal here by a characteristic mark, which seems to me decisive, in the monogram found on the square drachma of Apollodotus, and which, added to the symbol of *the elephant's head*, used on the little bronze of Menander, appear to guarantee this coin as the produce of a Bactrian mint. As regards the prince whose name our medal bears, whose existence and whose reign it alone, among the ancient relics which remain to us, reveals, it would be superfluous to give oneself up to conjecture, which can rest on no solid base. However, I cannot help remarking that this name affords very nearly a transcript of both the Zend and Sanscrit words signifying *moon*, *Mao*, with the sign of the Greek genitive, **MAYOY**. To bear out this observation, I may call to mind that the Bactrian medals of the Indo-Scythic series, belonging to the reign of Kanerkes, present us ordinarily on the reverse of the figure of *the standing prince*, a *personage*, the head surrounded by a radiated halo, designated at times by the Greek word **ΗΑΙΟΣ**, *Sun*, at other times, and most frequently, by the Zend words **MIΘPO** or **MAO**, *Sun* or *Moon* indiscriminately. These medals, lately published by the Asiatic Society of Bengal, with learned observations on them by Mr James Prinsep, are found also in almost all their varieties in the collection we owe to General Allard, and the notion which we thence derive of a personification of some deity of the Bactrian mythology, answering at once to both the *male* and *female* of light, and designable either by the term *Mithro*, or by that of *Mao*, according as the *male* and *female* principle of this androgyne deity prevailed in its representation, appears susceptible of no sort of doubt. This is the same idea which produced the figure of a *god Lunus*, so common on the Græco-Asiatic coins, in the likeness in which he is most commonly represented as a *young man*, crowned with a radiated tiara, with a loose robe on his shoulders, and mounted on a horse, an animal consecrated in all ancient religions to the *Sun*, and the *god Lunus* must have answered to the lunar genius *Mahv*, of the Zendish works. This same idea is it, which is again found under another form in the *goddess* of *Comana*, a goddess equally androgyne, the worship of whom,

established in Pontus from of old, may be traced indisputably to an Asiatic origin, and whose real name *Mac*, as given by Strabo himself, a native of those regions, is precisely the Sanscrit name of the *Moon*. This being established, it might not be impossible that the name *MAYOY*, joined to the word *ΒΑΣΙΛΕΩΣ*, on our Bactrian coin, might be an equivalent for the name *Apollodotus*, suggested perhaps by the same motive which had caused the choice of the figure of *Apollo* as type of the coin of *Apollodotus*. Under this hypothesis, the various numismatic indices which made me assign our medal to the epoch of that prince, would be fully borne out as true by gaining thus their full force. This is however no more than a conjecture, which I submit most deferentially to our philologists in the tongues of India, through whom alone, one may hope for the solution of this curious problem."

I confess this does not seem to me to be a question referable for decision to a philological test, of the nature above specified. The word *MAYOY* may indeed be derived in the manner suggested by Mons de Raoul Rochette in the above ingenious paper, but *with the Caduceus on the coin*, the application of it would I think be more readily made to Mercury, than to the "androgynous deity," or "Deus Lunus," whom the writer points to as affording in the analogous shape of *Apollo*, an equivalent to *Apollodotus*. The *Caduceus* is too remarkable an emblem to be mistaken as regards its reference: it has been found on the coins of this series, only in juxtaposition with the name of *Demetrius*, and with the mysterious word, *Mayus*, this coincidence enables me to suggest a direct mythological meaning to the unknown term, without attempting to interfere with the philological exposition of Mons de Raoul Rochette. Mercury, whose parentage is (Sophocles *Electra*, "*μαίας παῖς*" Eurip. *Rhesus*, and Helen, "*μαῖαδος τοκος*") ordinarily noted with direct reference by Greek poets to his mother, is named by a purely classic author (Eurip. *Medea* v 759) as ὁ *μαίας ἀναξ*, a poetic license, in which however may be found an approximation to a masculine *matronymic*, applicable to the deity, and corrupted in after years, under the impure dialect of a distant military colony into the word before us. Thus allowing the philological theory, I am inclined to find in *MAO* the original of *Maia*, the fabled mother of Mercury, and to detect in this masculine adaptation of her name, not an androgynous deity, but the

" — *Almæ*

Filius Maiæ —"

himself, especially as the peculiar emblem of the god occupies the reverse on which the legend **MAYOY** appears. There are, I think, sufficient reasons against admitting the application to Apollodotus of this attributive epithet, independently of any force which may attach to what has been above stated, in as much as we already know Apollodotus by two distinct peculiar cognomina, assigned to him in a form, which as Mr J Prinsep observes, affords in its emphatic singularity a sort of phænomenon in numismatics, I mean, in the use of the conjunction **Και** between the words in the legend **ΑΠΟΛΛΟΔΟΤΟΥ ΒΑΣΙΛΕΩΣ ΣΩΤΗΡΟΣ ΚΑΙ ΦΙΛΟΠΑΤΟΡΟΣ** (Vide vol II As Jour p 406) Now it is possible that instances may be adduced in which a number of different attributive epithets are to be found applied to some distinguished personage in Grecian history, but the course of ordinary experience is against this, and one may reasonably conclude (even supposing no other argument existed to disprove the claim of Apollodotus to the title) that **MAYOY** would not be assigned to him on any coin in addition to his other designations, (vide vol II Asiatic Society's Journal, Pl VIII vol IV Pl XXV) I would on the above grounds then, deny the conjecture of "king Mayus" being identifiable with Apollodotus, though I will again avail myself of part of the argument of the able conjecturist to assign the title to its real owner.

In the extract from the *Journal des Savans*, above translated, very sufficient reasons have been assigned for considering the *Mayus* coin as contemporaneous in its manufacture with Apollodotus, but, not being a coin of Apollodotus, the fact of its having been struck at an epoch almost identified with his own, gives me a stronger right to assign the coin to one, whom Mr James Prinsep, (vol II Asiatic Society's Journal, p 410,) conceives may have been the elder brother of Apollodotus, Demetrius in fact, whose name we have impressed upon a coin precisely similar in all but the presence of that name, to the *Mayus* medal, on which so much ingenious conjecture has been expended. The elephant's head with the bell, is common to both, the circular ornament, the monogram, and, lastly, the remarkable type of the Caduceus, are found exhibited in exact fac-simile, leading to the natural conclusion, that the **ΒΑΣΙΛΕΩΣ MAYOY** of the one is the **ΒΑΣΙΛΕΩΣ ΔΗΜΗΤΡΙΟΥ** of the other. The title, or synonyme rather, may very probably have been with Demetrius as with Mercury, a *matronymic*, and bestowed perhaps in adulation or in fondness on the princely offspring of some mortal Maïæ.

Suppose this fairly proved, and another clue is found to the authentication of the history of Demetrius, since, the *Mayus* coins having been

found in Bactria Proper, stronger grounds are elicited for believing that he did succeed Euthydemus in his hereditary possession of the integral kingdom. The rare occurrence of the *Mayus* or of the Demetrius coins, seems to suggest that he was very shortly after his succession ejected by Eucratides. Mr. Schlegel, who assumes that he did not succeed his father in Bactria, but who acknowledges his ejection from his paternal dominions, and his retirement into Arachosia, must allow that to be ejected, he must have once possessed

As governor during his father's life time, of provinces along the Indus, the elephant's head would be an appropriate type for the coin struck by Demetrius. The bell, which appears to have attracted so much attention in Paris, is in shape and proportion similar to the large bells now in common use with native chieftains in Upper India, saving with a rope on either side the elephant, instead of about his neck, as in the coin. The object of the modern custom is to regulate the pace of the animal by the alternate sound of the swinging bell, the ancient practice originated, perhaps, in some similar fancy.

Should any of our contributors see reason to think that these observations have really made out the point they are intended to establish, may I hope that the idea of further success in elucidating fact as regards a very interesting, but most obscure epoch, will encourage them to make public the fruits of their research? I have requested Captain Hay to favour me with drawings of the most remarkable coins in his collection, and am most sorry to say that I have been as yet unable to have lithographs taken from the impressions in sealing wax which he has sent me. [F]

Memorandum on the differences of the Meridian of the Observatory at Madras and the Flag-Staff of Fort William and of the Cantonment of Futtehghur in the Doab — By Colonel J. A. HODGSON, late Surveyor-General of India.

I purpose in the following remarks, to give an account of the above differences, as deduced from eclipses of the first satellite of Jupiter, made by myself, and to add some notices regarding the modes of determining the longitudes, and latitudes, of places in Asia, which may be found useful to the officers of this army, now serving in places far distant from each other.

The Indian Government has for upwards of fifty years maintained an Observatory at Madras, but until 1829, it was

which Mr. Taylor thinks may be 8 or 10 seconds in defect. Mr Taylor, who has now, I believe, gone to England, will no doubt find there, numerous observations with which he can *compare* the above, and the subsequent observations he has made, and will be able to put to the test, the value of the lunar transits, when he has the comparisons from the 1st. and 2nd limbs of the moon in *equal and greater numbers*, he will also get correspondents for his numerous sights of Jupiter's satellites we shall *then see*, how far the two modes, by the transits and by the satellites, agree with each other. It is an inquiry of interest, but in the interval, I think we may fairly take the mean of what I have above stated, thus—

	h.	m.	s
Mr Goldingham's 1st and 2nd satellites,	5	21	9.40
Mr Taylor's 1st satellite and lunar transits			3.77
Ditto, 2nd. satellite of ditto, ditto,	5	20	55.62
<i>Mean Madras Obsy</i>	5	21	02.93

The following series of nine immersions, and eight emersions of the first satellite is selected from my notes, as having been made under the circumstances most favourable to accuracy. Those circumstances are, that the immersions and emersions be *equal in number*, these are nearly so—it is proper that they should be taken with *telescopes of the same description*, at either place, these were *so* taken, the telescopes being those of Dollond, of 45 inches focal length, aperture 2 inches .7 and power 70 to 75,—that the *same* person observe at each place; I myself did so at the Surveyor-General's House at Chowringhee, Calcutta, and the *same* individual, I believed, took the eclipses at the Madras Observatory—the satellite was the *first*, which by reason of its quicker motion, gives the best results. The circumstances of climate, and altitude of the planet, did not very materially differ at Calcutta and Madras. When these conditions are attended to, a moderate number of corresponding sights will give a better difference than a far greater number would under other circumstances. I have the dates and particulars of all these eclipses, but it would take too much space to insert them here, they were taken in 1821, 1826, 1827. The differences in time, reduced to the Flag-Staff, are—

<i>Emissions</i>		<i>Immisions</i>	
m	s	m	s
32	23 70	31	57 90
32	38 30	31	52 70
32	27 00	31	28 00
32	08 00	32	08 29
32	12 70	32	09 51
32	27 10	31	56 09
32	51 50	32	11 76
32	26 10	32	08 91
32	17 70		
Mean of 9 emissions,		m	s
Ditto of 8 immisions,		32	25·79
		31	59 08
Mean of emissions and immisions			
of the 1st satellite,		32	12 4
The mean before stated for the Madras		h	
Observatory,		5 21	2 9
		5 53	15 3
Longitude of Flag-Staff, Fort Wilham,		88° 18'	45"

I must mention, that I should have taken a greater number of eclipses of the satellites in Calcutta, had I not been absent from it on duty, in the North-west provinces, from 1822 to the rains of 1826. To several of my observations of eclipses in 1821, I found correspondents, in the series taken by the late Colonel Beaufoy, at Bushey Heath, they give for the Flag-Staff 5h 53m. 10s.3. I sent to the excellent astronomer at the Cape of Good Hope, the late Rev Fearon Fallows, the particulars of my observations, requesting him to give me correspondents, if he had any. I may here most conveniently make an extract from his reply (dated 1st September, 1823) to my letter. He says, "Amongst the very few eclipses which had been taken, I could not find any corresponding to the date of your observations, which I am happy to say bear the stamp of being taken with great accuracy. As the calculations of these eclipses are not made from the most approved tables, (De Lamberts,) and as you may be desirous of seeing your result

“compared with those tables, I shall take the liberty of selecting those which appear to me to have been taken by the same person, and with the same telescope The longitude of the Surveyor-General’s Office at Calcutta, from comparison of observations, made of Jupiter’s 1st satellite, with De Lambre’s tables

Date		Emersions			Date		Immersion		
		h	m	s			h	m	s
1821	Nov. 22	5	53	16	1822	Oct 10	5	53	64
	Dec. 8			123		Oct 24	5	52	554
1822	Jan 7			85		— 26	5	53	120
	— 16			57		— 31			65
	Nov 27			102		Nov 18			10
	Dec 13	5	52	561					
		5	53	573					
		5	53	426					
	Mean	5	53	500			5	53	426

“The mean is about twelve seconds of time less than you make it by the Nautical Almanac, yet the accordance between the means of the emersions and immersions, is truly surprising” These observations, with particulars of the transit of Mercury, Mr Fallows sent to the Admiralty Though the result deduced by him is *not* from corresponding sights, yet the corrections made by so skilful an astronomer, and his opinion of their value, may be thought to render them worthy of some notice In 1821 and 1822 the Surveyor General’s Office was at No 8, Russell Street, Chowringhee The reduction to the Fort Flag-Staff is four seconds of time, it will therefore, by these observations, be in 5h 53m 3s 1 = 88° 15’ 15”

If the above eclipses were in sufficient number to entitle them to a place on the mean, it would give for the Madras Observatory, 5h 20m 59s 34

Another mode by which I endeavoured to find the meridian of Fort William, was by the transits of the moon’s limbs over the meridian, compared with those of stars differing little from her in right ascension and declination, for this purpose,

on my return to Calcutta in 1826, I instituted a series of these observations in the small temporary observatory on the roof of my house, No. 37, Park Street, Chowringhee. The transit telescope, of thirty-four inches focus, had five wires, though not large, was good, and firmly mounted, and the clock and other astronomical apparatus, were of the best kind. The transits were taken by the native assistant, the Syud, Mhir Mhosin, a most respectable man and steady observer; the calculations were made in my office, immediately after the transits were taken, by the computer, Mr. Vincent Rees, aided by the young men, apprentices, in the Survey Department

The whole of these calculations in detail, were inserted in lithographic forms, and were forwarded by the Government to the Royal Astronomical Society of London. They are contained in two large folio volumes. I need here only mention the results

From 19th Nov 1826, to 13th Dec. 1827.

	h.	m	s
82 transits of stars and moon's } preceding limb	5	53	29.43
82 transits do do following limb	5	53	12.89

Mean reduced to Flag-Staff	5	53	21.16
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These results, it is to be remarked, are deduced from the data in the *Nautical Almanac*, and *not* from *comparisons* with observations made at Greenwich, from which a better determination would be obtained, if so great a number of transits had been taken at Greenwich or Cambridge, but that is not likely to have been done in so short a space of time, in the cloudy climate of England, because, results from those transits, though very numerous, are only merely from *calculation* from the *Nautical Almanac*. I have thought it better, *not* to allow them a place in the general mean, though I did so in some observations I gave to the Marine Surveyor General, Captain Ross, and which, with observations he had taken, gave for the Flag-Staff 5h 53m 20s 7 as he has mentioned, in the notice published by him in 1829. It seems, I think, likely, from the

tendency of Mr Taylor's subsequent operations at Madras, that the meridian of Fort William Flag-Staff will prove to be less than the above

This method of determining longitudes, or rather *differences* of longitude, has been much recommended of late by astronomers, and doubtless it is as capable of great accuracy, when a long series of corresponding sights can be taken in fixed observatories, but to those to whose lot it falls, for the most part, to determine new positions,—to military and maritime officers, and to scientific travellers,—it will not I fear be found so generally convenient, as it may appear to be. It is requisite, that the transit instrument be good, and well and firmly fixed, and that the sights be most carefully made, for an error of only two-tenths of a second of time, on the observation of the transit of the moon's limb, will on her mean motion cause an error of six seconds of time in the longitude. To duly estimate a small part of time requires much practice, and it is difficult to be sure of the precise instant when the moon's *preceding limb* touches the wire, it is *perhaps* rather less so of the *following* limb leaving the wire, but a mean must be taken, add to this, that except to those, whose sole occupation is in a fixed observatory, it would be very irksome to get through a long series of lunar transits, at the varying periods of three quarters of an hour's difference of time, every night. On these accounts, I hope the satellites of Jupiter (especially the first) will meet with more favour than has been allowed to them lately, in some notices on practical astronomy. I believe that by their means, the meridian of *more* distant places have been nearly settled, and more useful additions, in that particular, made to Geography, than by any other mode, and from long experience, I find that great dependence is to be placed on the results, *provided* the requisite conditions, which I have mentioned, are attended to. In this extensive country, we little need insist on the important consequences of well determined differences of longitude. Moderate distances, can be best laid down from *survey*, and referred to some known meridian, but it frequently happens in the emergency of service, that officers even on a survey, are detached to a great distance from their field of operations, with

which their new positions cannot be connected, *except* by astronomical means. This was particularly the case, when the revenue surveyors in the North-western provinces were suddenly ordered to join the armies on the eastern frontiers, in the Burmese war. I was at that time the Revenue Surveyor-General. With those officers, though they were withdrawn from my superintendence, I continued to keep private correspondence, and I particularly requested them to make as many observations of the satellites as they could, that I might compare them with those I made at Futtehghur, and to the skill and zeal of Majors Bedford and Wilcox, in Assam, to Major Pemberton, in Munnipour, of Major Fisher, in Sylhet, Capt Wroughton in Arracan, and the late Capt Grant, at Promc, (all officers of the Bengal Native Infantry Regiments,) I am indebted for many data, by which the geography of the eastern frontiers has been so much improved. It may serve to give an idea of the extended field of their operations, merely to mention that the observed difference of longitude taken by me at Futtehghur, and Major Wilcox at Suddia in Assam, by the 1st satellite, was in time, 1h. 4m 15s, or 964 miles of longitude.

When places like Suddia, Munnipour, and others at such great distances, and to which there had been no opportunity of extending geodesic surveys, can have their positions assigned to them exactly in latitude, and within perhaps two to three miles, or indeed I think within less, by a few correspondent observations of the satellites, they serve as starting points, from which to originate more detailed and local surveys, in those new countries. As an example,

I will now give the differences of meridian of Futtehghur and Madras Observatory. My house at Futtehghur was on the high right bank of the Ganges, and nearly in the rear of the left of the Native Infantry lines, and in latitude $27^{\circ} 21' 37''$.

	Date	Set	Im or Em	Madras time				Futtchghur time				Difference	
1824	Dec 21	1	Immersion	h	m	s		h	m	s		m	s
—	— 9	—	Do	11	36	41	7	11	33	56	3	2	44 8
—	—	—	Do	13	29	57	8	13	27	03	8	2	54 9
1825	—	—	Do	17	16	46	7	17	13	32	3	3	13 4
1825	Jan 10	1	Do	10	00	75	6	9	57	17	3	3	18 2
—	— 26	1	Do	9	15	28	6	8	13	13	0	2	15 6
				5 Immersions				Mean				2 53	
1825	Mar 22	1	Immersion	h	m	s		h	m	s			
—	—	1	Do	7	17	05	7	7	11	12	0	2	23 7
—	—	1	Do	9	11	32	5	9	09	20	0	2	12
—	April 5	1	Do	11	06	23	0	11	01	19	0	2	01 0
—	— 21	1	Do	9	25	07	4	9	22	59	0	2	08 1
—	— 25	1	Do	11	20	15	6	11	18	03	0	2	12 6
				5 Immersions				Mean				2 12	

Mean of Immersions and Emergences

2 32 7

Madras Observatory

5 21 2 9

Futtchghur

5 18 30 2

The above were all taken with Troughton's 46-inch telescope, power 64, and *by myself*, except one immersion on the 9th December, which was observed by Mr William Rix James, one of my best sub-assistants. At the same time observations were taken by several young men, apprentices in the Revenue Survey Department, in my presence, but I did not allow of any communication between them,—each gave to me, on the spot, separately and silently, the time at which he noted the phenomenon.

The following are the differences given by numerous immersions and emersions of 1st satellite

			m	s
Dollond's 64-inch telescope, power	100		2	28 7
Troughton's 46 Do Do. power	64		2	29 2
Dollond's 45 Do. Do	75		2	32 4

Mean, 2 30 1

h

Madras Observatory, 5 21 2 9

Futtchghur, Do. 5 18 32 8

These were the best telescopes, and used by the steadiest observers, but not always the same instrument, by the *same* person. The mean of these, with that of *my* individual sights, give 2m 31s 40 for the difference, which must be near the truth, and for my station 5h 18m 32s 37, or 79° 38', that is, if the meridian of Madras be correctly settled.

I may further mention, that I took and compared with the Nautical Almanac six immersions, and an *equal* number of emissions of the 1st satellite—they give,

	h	m	s
6 immersions,	5	18	32 7
6 emissions,	5	18	38 3
Mean,	5	18	35 5

All taken with Troughton's 46-inch telescope, power 64, and by the *same* person.

I have extended these remarks to a far greater length than I intended, but perhaps some notice of another mode of investigating the longitude, may be useful to the officers of the Bengal army, who are serving with our regiments from Afghanistan to China. This is the well known mode of lunar distances from the sun and stars, which has not been so much used on land, as it might be, and with very great advantage, in the clear atmosphere of Asia, frequent opportunities of seeing the moon and stars and sun occur, the mode of operating is not difficult, and the instruments required are easy of carriage, and do not require any fixed supports. The calculation is rendered simple, and the results satisfactory, by means of the correct data in the Nautical Almanac, with these, and that most excellent of all instruments, *Troughton's reflecting circle*, any officer may, with a little practice, do good service to geography. I wish it to be understood, that it is not by the *sextant* that we are to look for such results, it being only a second best instrument, but from the *circle*, which is, though a little heavier, equally, nay, *more convenient*, in use, than that imperfect part of a circle, the sextant, which should never be used on land, nor at sea either, if satisfactory longitudes are hoped for, and where are they more required.

As Troughton's directions for using his circle are not universally known, I will here extract from them a few lines, in which he plainly states its advantages, when compared with the sextant, they are chiefly these —

“ The observations for finding the index error, are rendered useless, all knowledge of that, being put out of the question, by observations both forwards and backwards By the same means the errors of the *dark* glasses are also corrected, for if they increase the angle one way, they must diminish it the other, by the same quantity This also perfectly corrects the error of the horizon glass, and those of the index glass, very nearly But what is of still more importance, the error of *the centre* is perfectly connected, by reading the three branches of the index, while this property, combined with that of observing both ways, probably reduces the errors of dividing, to *one-sixth part* of their simple value Moreover, angles can be measured as far as one hundred and fifty degrees, consequently the sun's double altitude may be observed, when his distance from the zenith is not less than fifteen degrees, at which altitude the head of the observer begins to intercept the rays of light, incident on the artificial horizon, and of course if a greater angle could be measured, it would be of no use in this respect.”

Mr Troughton has not noticed a farther great advantage, in there being no need to take the index error of the circle, as there is with the sextant, the finding this error with the *latter*, as it is generally done by measuring the sun's diameter, on each side of the zero, is well known in these hot countries to be a most painful, as well as a tedious and uncertain operation, and we measure only on a small part of the arc the glaring disk of the sun, through the stained glasses, which we see under a very different degree of brightness, from that under which we take the contact of the moon and sun or stars, and this index error *ought*, with the very best sextant, to be rigorously examined at *each* observation.

With the circle the correction for the zero point is included in the *observed* distances on both arcs, and given on six parts of

the circumference, and what is of great consequence, the observed objects have the same, or very nearly the same, degree of light, so that the eye has not to change its focus and condition, besides, if the reading of the three indexes take up more time, it is a very little more than the reading of one, it is amply repaid by the time gained, in not being obliged to take the index error

In Mr Troughton's paper, he, in his usual clear manner, explained the adjustments and mode of using his circle. I give one more extract from it, to shew the opinion of him, allowed to be the best artist in Europe, of its value, he says—

“The greatest error, to which dividing by a good engine is liable, may be taken at about twenty seconds, the six readings required in a double observation on different parts of the circumference, will probably reduce that error to within five seconds, where the reflecting glasses and telescopes are good, and power considerable (about twelve) a mean of contacts will come out within this quantity, and where every other source of error is corrected by the principles of the instrument, we are of opinion, that a series of *lunar observations* will give the longitude on land, nearly, if not quite, as accurately, as can be obtained from an occultation of a star, by the moon, when observed with a powerful telescope.”

It is well known that Mr. Troughton made more and better sextants than any other artist, and of course derived much profit by their sale, yet such was his disinterested desire that his circle should come into general use, that he made the price only one guinea more than that of his best sextants, though the real difference of cost in material and workmanship is considerable. On the same terms, and with the same excellence of execution, Troughton's reflecting circles are now supplied and constructed by his worthy successor, Mr William Simms, F R S., an artist whom Mr. Troughton selected as best worthy to sustain his great reputation.

The chief reason why the circle has not come into more general use *at sea*, is its greater weight than the sextant, and the partiality men feel for instruments they have been used to,

but the difference of weight is not much, and after being accustomed to it, it feels steadier in the hand than the sextant. It may indeed happen when a ship has much motion, that in *one* position of the circle, the right hand being further from the eye than it is with a sextant, a degree of inconvenience is felt, but it is soon surmounted, and is moreover balanced by the convenience of having two handles to the circle, so that the face is never held downwards, as the sextant must frequently be.

There is indeed a little longer time required to read off the three verniers than the single one of the sextant, and this may sometimes make the assisting observers of the sun and moon's altitude impatient, or less attentive. For my part, I think that lunar observations are most satisfactorily taken *without an assistant*, except one to note the watch, (and one may be dispensed with) all that is required, is to have, say, a sextant and a good quadrant. Then proceed to take one altitude of the moon, and lay the sextant down,—that done, take one of the sun, with the *quadrant*, and lay it down,—then take two or three sets of distances with the circle on both arcs, and then observe the altitudes of sun and moon, noting all the times.

All these things, with a little pre-arrangement, may be soon and *calmly* done, which is the chief thing, and readily reduced to the mean of times and distances, but if two instruments are not available, the altitudes may be taken with the circle. On shore the altitudes of sun or star and moon may be taken with a well adjusted theodolite, or sextant, or the circle, and if the observer has not an assistant, the seconds of time may be conveniently noted by the beat of a metronome, but a practised observer will himself count the seconds correctly. Or if the latitude and time are correctly known, as they can be *on land*, altitudes of the sun, moon, or stars, may be calculated. In investigating longitudes *on shore*, the time should always be determined by equal altitudes of the sun or stars, which may be taken by two or three sextants with the artificial horizon, or by meridian passages of stars made with a portable transit telescope. Lithographic forms are useful, in which to fill up all the figures of calculations, and these should always be preserved.

In determining *latitudes*, the reflecting circle is most useful to the geographical surveyor and navigator. By no instrument can so many good observations be taken in so short a time, the meridian altitudes of the sun and stars, one day or night, taken by the readings of the three branches of one arc are corrected by those of the next, but by a still more rapid, and equally accurate process in one day, a sufficient number of circummeridional altitudes of the sun can be taken, and reduced to the *meridian*. During ten minutes on each side of noon, ten or twelve double altitudes may be well taken from the artificial horizon, marking the horary angles by the chronometer, and at night, many stars may in like manner be calmly and well observed. They are best selected on both sides of the zenith, and the time from noon may be extended in proportion to the slowness of the star's motion, with the *pole star* to a great extent at sea, but on land, in geodesic operations, it may be extended to half an hour on each side of the meridian. Of course, as in a lunar distance, the observations must be taken on the right and left arcs alternately, or on equal numbers before and after the meridian passage. A stand is sometimes used with the circle, but I always found I could work quicker and better without. In oblique distances a support for the elbow is desirable, but in taking altitudes, the best way is to sit on the ground, the back being supported by a Hindostanee morah, or some such thing, *this* posture gives to the hands perfect command over the instrument, also remember that when the glass roof is used over the mercury it should be reversed at each contact. Circumstances *may* prevent observations with the circle being obtained on both the arcs, in such cases the instrument may be used in the manner of a sextant, and the index error applied, with this *advantage* over the sextant, that the index error, as well as the observed angle which it is to correct, is read on three verniers instead of on one, as with the sextant, also the index error may be taken on two small stars, or other well defined objects, subtending a greater angle than the sun's diameter, and the usual painful operation of measuring it avoided altogether. With the circle also, which is called at sea

the back observation, for the altitude of the sun or a star may be taken

To conclude, I can from long experience of its excellent properties, very confidently recommend to my brother officers of the Indian Army, the use of Troughton's reflecting circle, and also of a small theodolite, which I will describe, as it was lately constructed under the following circumstances. When I was in England, my opinion was demanded at the East India House as to the best construction of theodolites required for the revenue surveys, in the North-west provinces. I well knew the defects of the instruments hitherto supplied to the government, which were unsteady and top-heavy. I accordingly consulted Mr Simms, and we agreed on the construction of the instrument, I will now describe

This theodolite, though small, being only five inches in diameter, is of a stout firm make, the azimuthal circle has three verniers, and by it horizontal angles can be taken with much exactness, by taking them on both arcs, in the same manner as in the reflecting circle, each angle being from the result of six readings. When more exactness is required, several observations should of course be taken, and as a further check, the angles may be repeated on different parts of the limb, due attention being always paid to the lower, or watching telescope. The vertical angles are taken on a complete circle, which being capable of reversion has many advantages as to correct observations and means of adjustment. Altitudes and depressions are to be taken with the face of the vertical circle in one direction, it is then to be reversed in azimuth, and the operation repeated, there being room for the telescope to be turned over, as is done with astronomical circular instruments, and the vertical angles repeated. There are two levels as usual, but the correction of the line of collimation is best effected by taking the direct altitude of a stationary object, and its reflected image by depression on quicksilver. By this last mode of observing, also, a desirable degree of approximation to the latitude may be had when reflecting instruments are not at hand, or cannot be used.

A good sized magnetic compass is part of this theodolite, and can be applied above it, when required

The instrument is mounted on a brass tripod, which may be commodiously placed on a wall, or other situation, when the usual wooden stand (which it also has) cannot be used.

This theodolite being so portable and strong, would be found most useful to the military surveyor or scientific traveller

Mr Simms speedily completed an extensive order for these instruments, they were sent to the India House, and I suppose to India

Those officers who have the requisite opportunities and instruments, may also avail themselves of some other modes of determining differences of meridians

These modes (which are noticed in the account of the survey of the Himalya Mountains, in the 14th vol of the Asiatic Researches, page 189) consist in chronometrical observations, the sudden ignition of gunpowder at distant stations, and the observation of the horizontal angles subtended by any two or three of the well defined snowy peaks, the positions of which in latitude and longitude have been determined by the survey, these peaks, it is well known, are visible as well in the mountains as in the plains, at very great distances

J A H

Teetaghur, May, 1840

Proceedings of the Asiatic Society

Wednesday Evening, 1st April, 1840

The Hon'ble H T PRINSLI, Esq Vice-President, in the chair

The Proceedings of the last Meeting were read

The Rev Professor STREET and Rajah KISHTONATHA RAYA, proposed at the last Meeting, were balloted for, and duly elected members of the Society

Library

Read a letter from L H MADDOCK, Esq, Secretary to the Government of India, forwarding for inspection the following works—

Illustrations of Indian Botany, No 13

Figures of Indian plants, No 13 and 14 By Dr WIGHT

Read a letter from Col J STUART, Secretary to the Government of India, Military Department, forwarding copy of a work containing the result of Astronomical observations at the Observatory of the Madras Presidency, during the years 1838 and 1839

Literary and Antiquities

Read a letter from H FORRENS, Esq late Officiating Secretary to the Government of India, General Department, transmitting three books, being a Political and

Historical account of the British settlements in the Straits of Malacca, from the year 1785 to July 1839, by Capt James Low

Resolved that they be referred to the Committee of Papers

Physical

Read a letter from Mr WOODHOUSE, Assistant Colonial Secretary at Colombo, forwarding a copy of the Tide Register kept at Trincomalee during the year 1839

Read a letter from Lieut Col HODGSON, presenting a stuffed Albatross

Skin of a Cat and and also a specimen of the glue root, were presented by
Dr H H SIEVE

The Annual Report of the past year was then read

Secretaries' Annual Report

On a review of the proceedings of the Society, for the year 1839, we submit to you this Report

Your Society has been stationary during the past year 12 ordinary Members have been admitted, and 13 have been lost by death and departure for Europe Those who have died, are Mr G A PRINSEI, Dr BAIN, Mr W K EWART, Captain J TAYLOR, and Mr C BROWNLOW an associate Member Those who have quitted India are His Excellency Sir H FANE, the Hon Col MORRISON, Mr C G MANSELL, Dr G EVANS, Mr W CRACROFT, Dr J MARTIN, Lieut Col LOW, and Mr D ROSS Of your honorary Members, we regret to notice the death of two distinguished Orientalists, Baron DE SACY and M DE TASSY The reputation of DE SACY, and his valuable labours in the field of Oriental Literature, need no eulogium Our feeble praise could add nothing to his well deserved fame

Publications

We noticed in our last report the completion of the 11th vol of the Mahabharat, and the defect of plates which rendered the Sharrin Vidya, the Sanscrit Version of Hooper's Anatomy, incomplete Fifty pounds have been remitted to England on account, and we hope that in the course of the year, we shall receive from Europe well executed plates, which will render the translation of that useful work subservient to the extension of sound Medical knowledge amongst the Hindu classical cultivators of the science

The Sharay-ul-Islam, noticed in our last report, has been completed, and we trust this publication, which treats on the civil law of the Arabs, according to the doctrine of the juris-consults of the Shea sect, will be found to supply a want which we believe was sensibly felt

We bring also to your notice, that Part II of the XIX Vol of your Physical Researches has since our last report been published

Museum

We here introduce the following interesting report of your Curator, in regard to this branch of your Institution

"The donations to the Museum are communicated monthly with the proceedings of the Society The only donation omitted in the usual place, is that of a collection of several fishes from Mr R J ROSE, in spirits supplied for the purpose This little collection, consisting of ten or fifteen species, includes two or three kinds of cels, which Mr ROSE states are very destructive to the embankments so essential

to the safety of the low districts at the head of the Bay, from their habits of burrowing, a curious fact not before known, I believe, of this family

"Our own establishment in the Museum have added considerably to our collection of fishes during the past year, and in a short time it may be hoped that we shall possess examples of most of the commoner species in Bengal. Our collection of skeletons has received three interesting additions, besides that made to it by the king of Oude, already acknowledged in the monthly proceedings, particularly that of a marsupial animal. The others are, a skeleton of a turtle, and of a gooiat, the former commenced by Dr EVANS

"Of birds, several interesting collections have been added to that of the Society during the same period, but as they have all been acknowledged in the monthly proceedings, it is unnecessary to specify them again in this place. For the safer preservation of objects in this department, the whole of the Ornithological cabinets ought to be removed before the ensuing rains, to the new room upstairs, on the west side of the house

"Of minerals, we have received from Dr SPRY, on the part of Captain JENKINS, Agent to the Governor General, 58 specimens from Cornwall, on condition that a similar collection of Indian specimens be presented by this Society to the Royal Geological Society of Cornwall

'The delay that has taken place in the supply of cabinets for the Society's minerals, has prevented, as yet, any return being made for this donation, in as much as our own collection must be first arranged before we can know what duplicates we have to offer in exchange, and the necessary examination of the collection cannot be made until the cabinets that have been ordered are supplied J M'CLELLAND

7th January, 1840

"P S —The number of animals set up in the Museum during the last year (1839,) is three hundred and seventy-seven (377,) including nine mammalia, two hundred and nineteen birds, and one hundred and twenty-nine fishes "

J M

Antiquities

We cannot report results and communications in this branch, so important as those referred to in our last. In the past year many valuable contributors have been withdrawn from their studies to the camp, to perform the active duties of their profession. But we may indulge in the hope that many, even in the busy scenes in which they have engaged, may have collected valuable materials, which future leisure may enable them to elaborate. The readers, however, of the Asiatic Journal will have observed several antique inscriptions, which may be pronounced interesting, and might have even been characterised as important, had not the exciting result of Mr JAMES PRINSEP'S researches raised our estimate of importance

Library

The accessions to the Library may be thus classified —

	Vols
English,	43
French,	74
Latin,	8
German,	10
Arabic,	6
Sanskrit,	3
Hindustani,	3

Finances

The useful additions, and thorough repair which your premises have received have much swelled the expenditure of the two past years. The outlay, however, has, we are happy to say, rendered the house commodious, and well adapted for the various objects you encourage. The following table shews your financial state

[The account current will be found at the end.]

Memorandum of the Books received into the Library in 1839

The Number of all the Books, large and small, in different Languages, on the stated subjects, amounts to 336

<i>English</i>		<i>Vols Pam No</i>		
Lardner's Cabinet Cyclopædia	Literary and Scientific Men	1	0	0
_____	Literary Men of France	1	0	0
_____	Statesmen	2	0	0
_____	Probabilities	1	0	0
_____	Biography,—English Poets	1	0	0
_____	History — Denmark	1	0	0
_____	_____ England	1	0	0
_____	_____ Greece	1	0	0
_____	Natural History,—Geology	1	0	0
_____	_____ Fish	1	0	0
Transactions		1	0	7
Reports		1	3	1
Proceedings		2	8	17
Journals		6	0	1
History		4	11	0
Naturalist's Library				
Accounts		1	0	0
Philosophy		1	0	0
Mathematics		1	0	0
Observations		0	2	0
List of Members of Societies		0	1	0
Maps		1	0	0
Botany		3	0	16
Illustrations		1	0	9
Catalogues		1	1	3
Treatises		0	1	0
Voyages		1	0	0
Memoirs		2	0	0
Documents		1	0	0
State Papers		3	0	0
Analysis, (Mackenzie's Collections, by Wilson)	Copies,	0	50	0
Descriptions		1	0	0
Miscellaneous		1	9	12
		13 32 66		

Brought over		43	32	66
<i>French</i>				
Researches	.	10	0	15
Reports		0	1	0
Bulletin	.	2	0	0
Natural History,		6	0	9
Notices		0	1	0
Collections		4	0	0
Grammar, (French and Armenian)		1	0	0
Miscellaneous		51	3	0
<hr/>				
<i>Latin</i>				
State Papers		2	2	0
Miscellaneous		6	1	0
<hr/>				
<i>German</i>				
Periodicals		4	0	0
Natural History		1	0	0
Treatises		1	0	0
Biography	.	4	0	0
Miscellaneous		0	5	0
<hr/>				
<i>Arabic</i>				
Dictionary, (Arabic and Latin)		1	0	0
Arabian Nights	Copies,	5	0	0
<hr/>				
<i>Sanscrit</i>				
Poetical Works		1	0	0
Psalms of David		1	0	0
The Ramayana		1	0	0
<hr/>				
<i>Hindustani</i>				
The New Testament		1	0	0
Miscellaneous	Copies	2	0	0
<hr/>				
Total,		147	99	90
<hr/>				

ASIATIC SOCIETY'S HOUSE
2nd January, 1840

ALEX CSOMA,
Librarian, Asiatic Society

Note —For the Books received in the month of January, see Journal Asiatic Society, No 3, new Series for March 1839

Day of the Month	Moon's Phases	Minimum Temperature observed at sun-rise					Maximum Pressure observed at 4 P M					Observations made at apparent Noon							
		Temperature		Wind	Aspect of the sky		Temperature		Wind	Aspect of the sky		Temperature		Wind	Aspect of the sky				
		Barometer	Of the Air				Barometer	Of the Air				Barometer	Of the Air						
		Of the Mercury	Of the Air	Of the Air	Of the Surface	Direction		Of the Mercury	Of the Air	Of the Air	Of the Surface	Direction		Of the Mercury	Of the Air	Of the Air	Of the Surface	Direction	
1	●	29.836	80.0	76.5	76.5	Calm	Clear	31.970	83.5	93.0	81.6	W	Clear	29.966	92.0	97.9	78.9	S W	Clear
2		29.904	80.5	77.0	76.8	Calm	Misty	30.960	84.4	92.8	81.9	W	Clear	29.943	88.2	96.4	82.0	W	Clear
3		29.864	81.5	76.8	76.8	Calm	Cir str intersp (a few)	30.944	84.9	94.4	81.0	W	Clear	29.888	87.4	101.5	82.6	W	Clear
4		29.819	81.8	75.0	75.0	Calm	Clear	30.884	85.7	91.0	81.6	S	Clear	29.867	88.9	94.5	84.0	S	Clear
5	)	27.772	82.8	76.9	77.8	Calm	Clear	30.816	86.0	90.0	81.0	S	Clear	27.835	90.7	94.7	82.9	S	Clear
6		27.766	83.0	80.0	78.0	Calm	Clear	30.808	85.5	87.8	82.8	SW	Mists	27.755	88.6	93.0	84.2	SW	Clear
7		27.640	82.9	79.9	78.1	S	Misty	30.798	85.0	88.5	83.0	SW	Mists	27.868	88.9	93.9	85.8	SW	Light Clouds
8		27.632	82.0	78.0	78.0	S	Misty	30.809	85.4	90.4	83.5	S	Clear	27.924	88.4	95.0	85.0	S	A few detached Clouds
9	)	27.779	82.0	78.5	78.5	S	Light Mists	30.827	85.9	88.0	83.5	W	Clear	27.840	88.7	94.9	85.9	S	Clear
10		27.739	82.5	80.0	78.0	S	Light Mists	30.796	85.8	88.5	82.5	S	Clear	27.860	88.7	94.5	85.5	S	Clear
11		27.712	82.8	80.0	78.5	Calm	Cloudy	30.770	86.2	90.0	83.5	S	Clear	27.846	88.9	95.4	85.5	S	Clear
12		27.741	82.9	79.9	79.0	Misty	Cloudy	30.804	87.2	89.5	88.0	S	Clear	27.707	88.0	97.8	84.0	S	Clear
13	)	27.700	83.0	80.0	79.1	S	Cloudy	30.812	86.5	94.9	84.6	S	Clear	27.812	81.0	103.0	85.0	W	Clear
14		27.712	82.5	80.5	79.4	Calm	Clear	30.774	86.3	94.8	83.0	W	Clear	27.644	90.0	101.9	83.0	W	Clear
15		27.718	82.3	80.0	78.0	S	Cloudy	30.776	86.0	92.5	84.0	S	Clear	27.629	89.5	102.0	81.0	W	Clear
16		27.718	81.4	78.0	77.9	S	Cloudy	30.780	86.5	90.0	85.0	S	Clear	27.777	90.9	96.0	85.0	W	Clear
17	O	27.749	81.8	78.9	78.5	S	Generally Clear	30.822	86.4	91.0	85.0	S	Clear	27.868	87.7	94.1	83.8	S	A few fragments of Cumuli
18		27.828	81.6	79.0	79.0	S	Cloudy partially	30.815	85.5	90.5	84.8	S	Clear	27.883	89.3	95.5	85.0	S	Cumuli detached
19		27.872	82.4	79.0	77.5	E	Generally Clear	30.844	86.0	90.0	81.5	S	Clear	27.850	87.7	91.5	84.8	S	Cumuli detached
20		27.841	81.6	75.5	73.2	E	Cirro Cumuli intersp.	30.828	85.9	88.5	87.0	E	Clear	27.844	84.8	91.0	81.0	S	Cloudy
21	(	27.828	81.9	70.8	70.5	E & N	Cirro-stratus	30.828	84.9	82.5	77.0	E	Clear	27.854	86.1	92.0	81.0	S	To the east at 8 fms cumuli
22		27.831	81.4	73.0	73.0	S	Light Mists	30.877	84.6	90.5	83.0	S	Clear	27.848	86.0	92.0	81.0	S	Cum str & Cum tench clear
23		27.786	82.0	77.9	77.0	S	A few detached Clouds	30.831	85.0	90.2	81.5	S	Clear	27.828	86.0	94.0	83.0	S	Clear
24		27.754	82.0	77.0	75.1	S	Generally Clear	30.810	85.5	90.0	81.5	S	Clear	27.802	88.0	95.0	87.0	S	Cumuli
25	(	27.654	83.0	81.0	80.0	Calm	Detached Clouds	30.822	85.9	90.0	83.8	S	Clear	27.676	87.0	91.2	83.5	high	Detached Clouds (floating)
26		27.649	81.3	79.0	77.5	S	Clear	30.844	86.5	88.5	84.0	high	Clear	27.680	86.2	90.0	82.5	high	Floating Cumuli
27		27.688	81.0	77.0	76.0	Calm	Cloudy	30.742	81.3	87.8	83.5	S	Cumuli and Haze	27.625	85.5	90.6	83.0	S	Cumuli
28		27.718	81.8	78.5	78.5	Calm	Generally Clear	30.780	85.9	90.0	83.5	E	Cumuli, Cloudy, occasionally	27.656	86.7	94.9	85.2	E	Cum Cloudy occasionally
29		27.708	82.5	80.0	79.0	Calm	Cloudy	30.764	85.6	90.0	82.9	E	Cloudy	27.644	86.4	93.0	82.9	E	Cloudy
30		27.608	82.0	79.0	77.9	Calm	Cloudy	30.744	84.0	86.5	81.5	E	Cloudy	27.644	86.4	93.0	80.0	E	Nimbi interspersed
Mean		27.765	81.9	78.1	77.3			30.816	85.1	90.1	82.5			27.802	88.1	94.7	83.4		

Day of the Month	Maximum Temperature observed at 2 P M					Minimum Pressure, observed at 4 P M					Observations made at sun-set					Rain Gauge				
	Barometer	Temperature		Wind	Aspect of the sky	Barometer	Temperature		Wind	Aspect of the sky	Barometer	Temperature		Wind	Aspect of the sky	Upper	Lower			
		Of the Mer- cure	Of the Air				Of the Mer- cure	Of the Air				Of the Mer- cure	Of the Air							
		Of the Surface	Of the Surface	Direction		Of the Mer- cure	Of the Air	Of the Surface	Direction		Of the Mer- cure	Of the Air	Of the Surface	Direction						
1	29.890	87.1	102.9	81.9	W	Clear	29.870	87.8	100.0	82.8	W	Clear	29.870	87.3	93.0	82.4	Calm	Clear		
2	29.840	88.2	103.5	81.1	W	Clear	29.832	88.2	101.5	73.2	W	Clear	29.840	87.8	91.6	82.8	Calm	Clear		
3	29.818	88.9	103.0	85.0	121.9	W	Clear	29.786	88.9	103.0	84.0	W	Clear	29.790	88.0	92.8	84.0	Calm	Clear	
4	29.816	90.0	98.2	86.0	120.0	S	Clear	29.788	89.5	94.8	86.8	S	Clear	29.793	88.2	90.0	84.0	Calm	To the N & Cum str	
5	27.729	88.5	95.9	84.9	119.3	S	Clear	27.696	87.2	91.8	84.0	S	Clear	27.700	86.0	89.0	81.5	...	Clear	
6	27.716	88.4	93.2	84.8	119.0	S	Clear	27.710	88.2	92.8	85.2	S	Clear	27.722	87.6	87.7	84.0	S	Generally Clear	
7	27.716	88.4	96.8	85.0	117.0	S	To the N Cum stratus	27.718	88.9	97.0	85.9	S	Clear	27.721	88.1	89.0	84.0	S	To the E N E Cum	
8	27.738	88.3	95.0	85.0	124.5	W	Cumuli detached	27.712	88.3	95.8	85.9	S	Cumulo-str	27.718	88.3	89.0	84.0	S	Clear str Hor Hazy	
9	27.770	88.3	94.1	81.8	114.8	E	To the N Cumulo-stratus	27.748	88.9	94.2	86.0	S	Clear	27.748	88.9	94.2	86.0	S	Clear	
10	27.716	90.0	94.1	85.9	115.0	S	Clear	27.718	90.0	94.8	85.9	S	Clear	27.718	90.0	94.8	85.9	S	Clear	
11	27.676	91.5	101.0	86.6	119.0	S	Generally Clear	27.683	91.7	97.9	85.9	S	Clear	27.683	91.7	97.9	85.9	S	Clear	
12	27.712	90.0	100.8	85.5	122.5	S	Clear	27.710	89.4	99.8	84.2	S	Clear	27.710	89.4	99.8	84.2	S	Clear	
13	27.704	92.1	107.0	81.8	130.5	W	Clear	27.704	93.6	104.2	84.0	W	Clear	27.704	90.1	89.0	83.0	...	Clear	
14	27.690	90.0	104.2	88.5	129.0	W	Clear	27.693	90.1	103.5	83.9	S	W	Clear	27.692	89.9	93.0	83.2	...	Clear
15	27.688	90.0	104.0	88.8	132.0	W	Clear	27.670	91.0	103.5	83.5	W	Clear	27.670	90.9	81.8	82.9	W	Clear	
16	27.711	91.9	97.9	84.9	125.0	S	Clear	27.704	90.9	95.9	84.0	S	Clear	27.708	90.0	93.0	81.8	...	Clear	
17	27.721	98.0	91.0	81.0	...	S	Cum detached (occasional)	27.720	87.6	86.0	84.0	S	Clear	27.728	86.8	85.2	83.9	W	Scattered Clouds	
18	27.836	88.8	95.2	84.2	117.0	S	Cumuli detached	27.830	88.8	94.8	81.0	S	Cumuli detached	27.834	87.0	86.8	81.9	S	A few Scattered clouds	
19	27.840	91.3	96.1	84.0	118.5	E	Cumuli detached	27.838	90.0	94.5	81.1	S	Cloudy	27.836	85.5	85.0	81.9	E	Dense Clouds intersp	
20	27.820	86.1	93.8	80.1	114.8	E	Cum str & Nimbi thunder	27.841	86.9	91.9	84.0	E	Cumulo-str	27.848	86.5	89.0	84.8	S	Scattered Clouds	
21	27.804	85.5	95.9	83.0	127.3	S	Cumuli a few	27.828	86.2	94.9	81.0	E	Cum str & Cumuli	27.844	85.9	91.5	78.8	S	Clear	
22	27.790	85.9	96.0	84.0	...	E & N	Cumulo-str. cloudy occa-	27.776	86.5	92.0	83.0	S	Cum str - Nimbus on	27.781	85.0	85.8	82.9	Calm	Generally Clear	
23	27.784	86.0	96.3	83.0	137.0	S	Cumuli a few (usually)	27.762	88.0	95.0	83.5	S	Clear	27.767	85.5	91.6	81.8	S	A few detached Clouds to	
24	27.761	86.9	95.5	84.1	128.5	S	Clear	27.768	86.9	94.0	82.7	S	A few detached Clouds	27.716	86.7	90.7	81.5	...	Cloudy (the S)	
25	27.680	87.5	93.2	83.2	114.0	S	high	27.684	89.5	92.8	82.0	high	Clear	27.684	87.5	88.1	81.4	S	Dense Clouds threatening	
26	27.620	86.5	92.8	82.8	109.0	S	high	27.600	86.5	89.9	82.0	high	Clear	27.606	86.2	88.7	81.5	...	Generally Clear	
27	27.679	88.0	94.0	83.8	116.0	S	Cumuli, Cloudy occasionally	27.670	88.0	91.2	83.0	S	Cloudy	27.667	87.3	91.0	81.0	Calm	Clear [of rain]	
28	27.680	87.5	94.8	83.2	113.3	Calm	Cloudy	27.681	87.1	94.0	...	Calm	Cum Cloudy occasionally	27.690	87.5	91.0	82.4	...	Cum str & a few drops	
29	27.704	85.5	84.4	84.8	...	N	Cloudy	27.692	84.8	84.2	90.0	N	Cloudy	27.692	84.8	81.8	79.0	...	Cloudy - Nimbi light drizz	
30	27.606	87.9	83.0	80.0	...	N	Nimbi Showery	27.580	84.2	79.9	78.2	Calm	Clouds	27.588	82.0	79.5	78.9	...	Nimbi interspersed [ling	
Mean	27.741	88.3	96.7	83.4	121.2			27.721	88.4	91.6	83.0			27.722	87.0	88.4	81.9			

JOURNAL

OF THE

ASIATIC SOCIETY.

Note of Discoveries of Gems from Kandahar —By Lieutenant
CONOLLY

MY DEAR SIR,

Kandahar, October 24, 1839

In default of something more interesting, you will perhaps not think the enclosed facsimiles of gems unworthy of place in your Journal. They are sent rather, it must be confessed, with the desire of gaining information, than a hope of being able to impart it. The number of the Journal which contains the Pehlevi Alphabet not being procurable here, we are unable to read the inscriptions. Our harvest of antiquities has as yet been most unpromising. This is partly owing to the disturbed state of the country, but also in a great measure to our researches having been confined to the southern provinces of Afghanistan, to which the Greek rule and civilization would seem only very partially to have extended. From Shikarpoie to Herat or Seistan there is hardly one stone edifice, and not one of antiquity. Pure Bactrian coins are very rare, and the only description found in any quantity, are coins having some connection with the Azos series; the most common being copper coins, with a head and illegible inscription on the obverse, with the Unadpherros reverse. Seistan, which we hoped would prove an Eldorado, furnishes, or has as yet furnished, nothing but these, together with numerous Sassanian and Arsakian coins. Of the Sassanian, the most common is a species not noticed in the Journal, but probably to be recognized in some of your numismatological works. Obverse, two heads, one with the usual Sassanian high cap and long beard, the other facing it smaller.

But leaving coins to a future opportunity, I proceed to lay before you the history of the gems forwarded.

1. A Buddhist (?) monogram on an agate, found at Kandahar

2 A female with child, and a hawk in her hand The figures on the margin, which might be mistaken for letters, seem rather to be birds, seals with this impression seem not to be uncommon, they have been found at Herat and Kandahar. The inclosed is from an agate

3 A Victory: agate. Kandahar

4 A do with fillet and palm branch, do

5 A seated figure. Rudely executed Pehlevi character ?

These are all of the collection of Colonel Stacy

Major Leech allows me to send you the following.—

6 Similar to No 2, Pehlevi letters distinct. Ruby.

7. Horse and rider, inscription indistinct

8 Bacchus or Silenus ?

9 A doubtful specimen, probably modern, representing a love scene from some of the innumerable tales, such as *Wamak* and *Oosra*, (a work which in spite of Van Hammer's boasted discovery, is common in Europe) *Adam and Door Khani*, &c. &c

10 The most perfect and curious specimen of the collection was dug out of the ruins of the ancient Boonaka, upon which is now erected Nadali, the Mokum of one of the four chiefs of Seistan. This place affords innumerable relics of antiquity. Climbing up the old mound with two or three attendants, we found three copper coins in as many minutes It is an agate seal with three faces, bored through so as to admit of its being worn round the neck I will not venture a conjecture on the subject of the engravings The head would seem to be Sassanian, while the peculiar position of the five fingers argue something mystical and Buddhistic

11. Has perhaps some relation to the punja in the above, it belongs to Colonel Stacy.

The next five are also from the ruins of Boonaka, nearly the only place in Seistan which has as yet yielded antiquities When the rain turns up the earth, the idlers hasten to the "Dujhulgurdi," as they call the rummaging of these old relics, and find large numbers of gems, small copper images of birds

and beasts, and copper, silver, and a few gold coins, the former chiefly Calphate and Sassanian. A potful just dug up, was brought to us from Peeshawroon, but they were every one entirely destroyed by rust, we did not get one gold coin

12. The Trisul, with a half-moon

13 A very rude Buddhist sitting figure

14 Brought on the same string with No 10 Sculpture very rude Obverse, apparently the Buddhist figure of the $\begin{smallmatrix} o \\ o \\ o \end{smallmatrix}$ series of coins, the other face, unless it be meant for two birds, I can make nothing of. Figures of birds and beasts on agate, cut on copper seals and imaged in copper, are found in such quantities in every old town all over Afghanistan, and so exactly similar, that they alone, if no other proof were at hand, would suffice to shew the former universality of the Buddhist creed Animals of all descriptions are found.

15 and 16. Two copper seals have, the first, a griffin, the other a Brahmune bull.

17. Is from a copper ring, which resembles in some points the circles of animals found in Ceylon, at Behat, &c On it may be perceived the hog, cat, two cocks, &c &c It was probably dug up from the Eimakh hills above Herat, which besides numerous small idols of stone and metal, furnish cylinders like those of Babylon,* with arrow-headed inscriptions I regret to have at present none to send you The reverse of 17 seems to represent flying figures

18. Is a seal. Are the letters Cufic?

The next paper on the subject of the antiquities, will I hope be better worth your attention, just now I have nothing of interest to forward, and am much pressed for time, being here a mere traveller en route to Caubul

Yours sincerely,

KHAN ALI

* NOTE —One of these cylinders was with the permission of the owner, Major Pottinger, laid before the Society at the last meeting with a collection of gems and coins from Herat I trust to have it in my power to compare it with a Babylonish cylinder Drawings of it and some of the gems are under preparation by Lieut Kittoe, who has with his usual kindness undertaken to enable me to insert them in the Journal

Note on Kandahar Gems.

It is extremely mortifying to be obliged to submit these very singular relics to the readers of the Journal without any thing beyond a conjectural comment upon them. The gems themselves must be, many of them, extremely well executed, arguing the existence of a high state of civilization among the people, with whom they were in use. The drawings, taken from the impressions in sealing wax with which Lieut Conolly has furnished me give, I should say, with one or two trifling exceptions, a very faithful, and accurate idea of the gems they are intended to represent. The figure of the Victory (No 4) might well compete in grace and spirit with the ordinary similar figures found on the ancient gems of Italy, or Greece. As the comparison by juxtaposition of one of such gems with the Victory might be thought interesting, I have inserted immediately below it a Jupiter (A) found at Civita Vecchia*. It is an agate, and the drawing has been taken from an impression in sealing wax, in order to put the European on exact par with the Asiatic antique. The result of the comparison is not, I think, to the disadvantage of the latter, and as the Jupiter has been, its possessor informs me, looked upon by competent judges in such gems as a good specimen, we may in a sort of vague manner assign a period to our Victory as having been produced under the purely Grecian dynasty of Bactria, when the arts of their fatherland were still cherished in something of their original beauty by the soldier-monarchs, whose arms constituted their right of empire.

The figures (as Nos 2 and 6) belong evidently to a very different era, were even the execution alone the test by which to judge of them. The gem No 10, again, is of a higher order of art, although bearing a *barbarian* legend. The head on one of the sides is cleverly cut, the hand on another well proportioned, and the characters of the inscription executed with much neatness. All speculation however on the style of workmanship as a test of the date of production of such gems is, for the present, idle. I have merely touched upon it, as believing that it may hereafter become a useful agent of verification, or even of discovery, when time, patience, and a larger experience in the varieties of these relics shall have given a clue to the assignment, or an approximation of the assignment, of their periods. That we may hope for this on sound grounds, I shall explain further on.

The monogram on No 1, I had at one time thought to have proved to be, as Lieut Conolly suggests, Boodhist, it is still under examination.

* Note — It is the property of Lieut George Reid, 1st Cavalry, to whose kindness the Society is indebted for the drawings of the gems published in this number, and without whose aid I could not have submitted a copy at length of the characters on them.

The figure No 2, with the child, seems to me to hold not "*a hawk*," but a parrot, on her hand. The frequent occurrence of a similar gem gives room to hope that the personage represented (mythological in all probability) may be identified, and I the more incline to think this, because among the figures which Lieut Conolly supposes to be rude representations of birds, I detect two distinct characters of the Pehlevi. May I beg the attention of our readers to this, and to the other inscriptions on these gems, and their aid in attempting to decypher them by means of the alphabets compiled (*As Jour* vol iv p 360) with such care and accuracy by our late Secretary?

I may here mention, that we have now in Afghanistan the advantage of an invaluable assistant in such researches, I mean Major Rawlinson, whose recent discoveries at Persepolis, communicated to the Royal Asiatic Society, must rank among the most important historical acquisitions of this country. Major Rawlinson's patience, enterprise, and ingenuity, have been rewarded by complete success in decyphering the well known inscriptions at that ancient city, the records contained in which go to verify the accuracy of Herodotus with regard to a portion of the work in which the Father of History has been hitherto (from want of corroborative testimony,) supposed to be most open to doubt and objection. The exact correspondence is said to be such that it might not be a wild supposition, were one to entertain the idea, that these very inscriptions had been the sources of his information. Having achieved so much, there is ample reason to conclude that the same spirit of inquiry will be as ably directed in researches into the present mysteries of Pehlevi, as of late into what was the sealed book of Zend. I have indeed the gratifying assurance of knowing that Major Rawlinson is already engaged in applying his information to his present field of action, as I am now keeping back a most interesting paper on Seistan, by Lieut Conolly, in order to have the advantage of notes and translations added to it by the accomplished scholar above-named. Under these circumstances I am justified in renewing my earnest request for information on all and every point of antiquarian interest beyond the Indus, in the deep conviction, that there do there exist the means of unfolding another page in the great book of the history of nations, with regard to countries, the "*officina gentium*," from of old to India. What of discovery as to the origin of the mixed tribes, and many peoples that inhabit the Peninsula, may not be elicited by a perseverance in research in this new and most interesting field!

Nos 3 and 4 and 5, I need not notice, as regards No 6 it is as well to observe that the figure there given, is not exactly similar to No 2, as suggested by Lieut Conolly. The child is held here on the opposite arm, and

the right hand is raised in a monitory attitude instead of supporting a hawk, or parrot The legend I have given in the lithograph accompanying this paper (No 2)

No 9, I cannot make out the meaning of, the figures of the goat and bullock are spirited and natural, while the human sitting figure, and another half-seen personage who appears to be offering a glass or cup, are so rude as to lead one to suppose they were purposely caricatured The material on which this is cut is not noted

The three-faced gem, No 10, is indeed an exceedingly curious relic The legend I have given at length to facilitate reference, as they do not show distinctly in the lithograph of the gem As to the meaning of the figures and symbols, after exhausting all the inquiry and conjecture my limited opportunities will allow me to engage in, I would decidedly consider them to be Boodhist The *head* might be (?) Boodh, the extension of the lobe of the ear in the figure, and the nature of the symbols appended on the other faces of the gem, might warrant the assumption It is unfortunate that Mr Csoma de Koros' excessive dislike for conjectural comments of this kind deprives me, as it invariably did our late Secretary, of his assistance upon the points now under consideration But in the absence of other aid, I had recourse to the assistance of a very intelligent *Jotee*, or Jain priest, at present resident in Calcutta He was originally from Dehli, has resided long at Lucknow, and has been about six years here I was fortunate enough to find him out while making inquiries through certain Jains of respectability, who chanced to have him for their Gooroo On showing him the impression of the head, and inquiring whether there was any ground for venturing to suppose that Boodh might be represented as with the *beard*, he decidedly negatived the supposition, and insisted that, though the other signs were Boodhistic, the head was not what I had suggested Having however pointed out the elongated lobe of the ear, which had escaped his observation at first, he was struck with the circumstance, and after some further examination made the remarkable discovery of the supposed *beard* being the cloth wrapper which his sect place before the mouth, letting it fall over the lower part of the face when engaged in religious discussion, in holy rites, or in teaching on points connected with their doctrine He appeared to be much surprised, and elated at this discovery, and did not entertain a doubt as to the identity of the head with Boodh The supposed beard was in fact, until explained with reference to its proper representation, an almost insurmountable argument against the head's being what I would have fain supposed it Captain Macleod, (of the Political Department) so long resident among a Boodhist population, had already in-

formed me of the impossibility of reconciling the bearded face with that of Boodh. I have again, and again, pored over the impression, and have examined it through a strong magnifier, with the hope, as may well be imagined, of being able to convince myself of the justness of the *Jotee's* supposition, but I must honestly confess, that I am by no means able to satisfy myself that he is right, though the line across the cheek may be taken as the edge of the cloth, which, when so worn, is fastened immediately behind the ear, in a straight line from the upper lip. My belief is, that the real explanation of the *head* is yet to be made.

The *hand* holds the position of what more than one very competent native informant, (among them Pandit Kamalakanta Vidyalanka), has described to me as a *Moodra*, or emblematic sign, common among Brahminical teachers. It is called the *Totwa Moodra*, and is used by the Gooroo while inculcating some doctrinal point, or explaining one of the mysteries of his religion to his disciple. Many of the readers of the Journal may doubtless have seen it used, and most of those at all conversant with the faith and habits of the Hindoos, will remember that Rama is ordinarily represented with the hand in this position. It is, in short, the sign of a religious teacher, or preacher.

It is also termed *Vyakhyana*, and among professors of the Brahminical doctrines is adopted on the authority of the following *Sloka* from the *Tantra Sara*

দক্ষিণাস্তু তত্র ন্যাবগুলগ্নে পরাস্থলীঃ । প্রসাধ্য সংহতোক্তানা এষা
ব্যর্থান মুদ্রিক। ॥ ত্রিরামস্য সরস্বত্যা প্রেষসীয়° সদাযতা ॥

This is translated literally, "The junction of the tips of the right thumb and forefinger, when disjoined from the other fingers, which are in a close and curved position, is called the *Vyakhyana Moodrika*. Know that this (moodra) is always an object, or source of pleasure to *Sree Rama*, and *Saraswati*, (Goddess of science and the arts)." The *Moodra* is not less Boodhistic than Brahminical. With the Jains it is termed *Oopdesh*, or *Unyoog Moodra*, all the terms in use with the professors of these creeds, having one reference to the instruction in, and inculcation of, essential truth. Indeed the *Jotee* directly he commenced giving me information on the points discussed at our meeting, as if by involuntary motion, put his right hand into the shape represented on the gem, covering his mouth with the left hand, so as immediately to recall by the mere action the conviction that the veiled mouth (?) and curved hand of the gem could belong to no set of types, but that of which a living example was before me. The triple-pointed symbol I had from the first considered Boodhistic, and some authorities which I had consulted, induced me to believe that the lower part of it was the *trikon*,

or triangle representing *the earth*, and the three *points*, the pinnacle of Meru, forming with the *Sun* and *Moon*, a general type of creation. The *Jotee* however informed me that the whole symbol was typical with his sect only of the mysterious mountain, "*Shumero Purbut*," or Meru, the which the Jains say is composed of four forests, the lower *Showmunsh banu*, "the flowery forest," the three upper ones, *Bhoodra shal banu*, *Pandooko banu*, and *Nundono banu*, "the fair sal forest, the yellow, and the pleasant forests." The Sun and Moon revolve, according to Buddhist faith, about the higher peaks, and are in this type of course appropriately introduced. Such is the explanation, which after infinite trouble, has been put together as a plausible commentary on the possible meaning of the figures on this remarkable gem. The inscription was of course a much more difficult subject of consideration, and under the impression that I had detected the Sassanian Pehlevi in its character, I persevered (with the aid of Mr Reid) in attempting to read the letters by the alphabet of the language above named. I even conceived that there was so much similarity in the forms of the letters, according to the way in which I read them, as almost to justify my publishing as conjectural the fruits of our endeavours under the above, as it proved, mistaken impression. While dwelling on this idea, I chanced to make a reference as to the Brahminical adoption of the *Moodra* represented on the gem, and in the course of it, showed the impression to Pandit Kamalakanta Vidyalkanka, as well as to other well informed Hindoos, among them, to my friend Race Seetanath Bhose Behadoor, who was of great service to me in the subsequent inquiry. To my surprise, he (reading the character in reverse of the mode which I had attempted in inexperience of the art of decyphering) recognized so much of a decidedly Sanscrit character in the letters as to induce me to make over the impression to him for deliberate study. I had already discovered the exact similarity of the letters in two of the faces, but the result of the Pandit's inquiry proved all three to be the same, and the character (as given in the lithograph, No 1,) to assimilate very closely, if not positively to coincide, with the Sanscrit (Buddhist, 500, B C) of the celebrated Baroda inscription. (Vide Asiatic Society's Journal, vol — p —,) I have only assigned letters in the Nagree character to those of the inscription, which by actual reference to the lithograph of the Baroda writing, I have seen exist there in exact facsimile. The rest the Pandit admits slight variations in, though very confident of the correctness of his reading on the whole sentence. He makes it जगद्राजो भयास्यो योजन लक्षम् || (jagadrajō bhagalayo yojana lakshan) which may be literally translated, "*The mansion of both the Lords of the World (Sun and Moon)*"

as a *lakh yojana*," or by paraphrase might be read, "The site of the influence of the two lords of the world extends (*a lakh yojana*) eight hundred thousand miles" The *yojana* (the measure occurring, Captain Macleod informs me as *Yoozana* in the religious and geographical works of the Burmese) is made of four measures of two thousand fathoms, (*Dhonuk* the distance between the extremities of the hands extended)

As respects the reading of the inscription, I think there is sufficient probability of correctness to justify its publication, but it will be observed that "ja," "ga," "na," and "lo," are the only exactly, or very nearly correspondent letters with those found on the Goojerat inscription. The compound "dra" (the third character of the inscription) is an arbitrary reading "Ya," which Kamalakanta interprets to be the character which recurs three times in the inscription, the sixth, eighth, and ninth letters, resembles the "ya," of the Goojerat type, but is not *identical* in shape. "Bha," is the Goojerat letter reversed. "Ska," is in the gem very minute, it is a double letter, clearly defined in the Goojerat type, its supposed correspondent in our inscription is sufficiently similar to authorise our giving it this value. Pandit Kamalakanta insists strongly upon the correctness of his rendering, arguing from the context where the character is obscure, in the critical observations by him on the reading, which I have above abridged, he repeatedly dwells on there not being "the slightest doubt" of the correctness of his interpretation. I have thought it best to affect less certainty for obvious reasons, however it must be remembered that the *lakh Yojan* is the Buddhist circle of the sun's revolution, and that this is most distinctly written on that face of the gem, which bears the symbol of Meru with the sun and moon revolving about it, for though it occurs on both the other faces, the characters are carelessly written, and are comparatively indistinct. What the intent of appending this motto might be, remains to be considered with reference to the general description of the gem.

Supposing it possible (which I can hardly suppose), that the head may be considered as representing Boodh, we should, without a forced interpretation, see in the gem, the seal, or perhaps amulet, of some zealous Boodhist, who bore about him in these emblematic devices a constant remembrance of the universality of the doctrine,—for instance, 1 Boodh, 2 The hand inculcating his true doctrine, 3 Throughout the celestial (and terrestrial?) system. The motto would have similar reference to the extension of the doctrine throughout "the mansion of the lords of the earth."

Supposing, however, the head to be that of a monarch, as the beard would not allow us to consider it that of a teacher, the repetition of the motto might lead one to suppose, that it contained some allusion to his name. Could he be some "*Jagad raya*," who by using the word in a double sense intended at once to celebrate his own name, and either allude to the

extension of his rule, or of his religion, or of both? The inculcation of the Boodhist creed expressed by the *Moodra*, and the allusion to the extension of that creed throughout created nature, would hold good, as bearing out this hypothesis, which seems for a conjectural explanation, as to a certain degree, of sufficient plausibility to bespeak attention. In the result of all the above tedious, and troublesome research, I would not venture to offer, as to this new field for investigation, more than a suggestion, as to possible meaning. It is my earnest hope that criticism may be thus encouraged, correction of error induced, and true conclusion elicited.

The inquiry into the meaning of the symbols on gems found in Afghanistan, and the adjacent countries, shall be continued with all diligence.

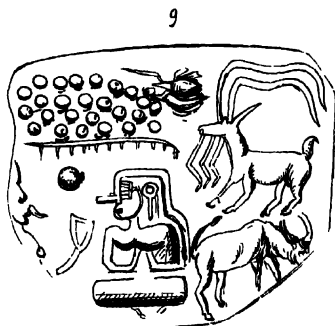
The *Jotee*,* to whom I have so often alluded, has undertaken to give me references from Jain books of authority on all symbolic types, which he may be enabled to give an interpretation of. I have by me a collection of gems, the property of Major Pottinger, on the examination of which the *Jotee* proposes to enter at once. Mr Conolly has supplied me with a second series of relics from the neighbourhood chiefly of Jullalabad, which although not so interesting as those now submitted, will nevertheless add, I trust, something to our stock of information. I must again earnestly beg for impressions at any rate of all gems—particularly of those bearing inscriptions—from the readers of the Journal beyond the Indus, and from those of their friends, who being possessed of such relics would be kind enough to allow them to be made use of. Gems from Nadah (Boonaka) would be of great value.

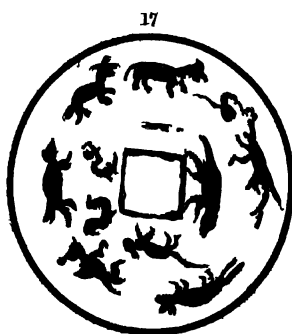
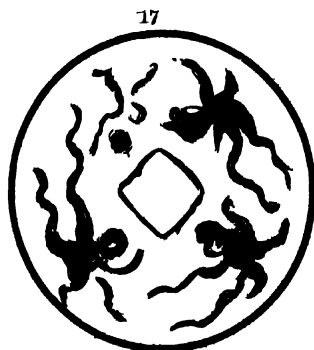
The character numbered 2 of the lithographs I have not, after the signal failure in giving a Pehlevi version of the other, ventured to give a rendering of. It continues under examination, with, I fear, small hope that it will be decyphered. The wax on which the impression is taken is so bad, that this alone has made the tracing of the letters difficult. They are from No 6, the monitory female figure, with a child. The execution of the figure I have already observed on, the characters are cleverly done, and assimilate to those of No 10.

On the remaining Nos I have no observation to offer in commendation of Lieut Conolly's, to whose zeal and intelligence the Society is once more deeply indebted. It will be observed that *five* of the impressions he notes in his letter do not appear in the lithographs. One or two appear never to have reached their destination, and the others I did not receive when taking charge of the papers of the Society. I hope however to receive them on some future occasion.



* I would gladly have given the name of this very intelligent and obliging person, had I been enabled, but it is with the Jain priests a practice *never to tell their name*. Many of the Hindoo religious have a somewhat similar scruple, but not to this extent. On requesting the *Jotee* to allow me to mention his name in the Journal, he was silent, and would not speak for several minutes. He afterwards told me that no Jain should ever utter his own name, or speak of his own actions.





№ 1

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ਜਨ ਲ

જ ગામનો મધાલયો ખોલવે લક્ષ્

№ 2

۱-۲-۳ { ۴-۵ } ۶-۷ { ۸-۹ }

A Second Memoir with reference to the Theory of the Law of Storms in India, being, Researches relating to the Storm of the 19th to the 21st September at the head of the Bay of Bengal, to the Great Hurricane at Coringa on the 16th November, 1839, and to another off the Island of Prepara on the 22d November By HENRY PIDDINGTON

PART I

My first Memoir on this subject, published in the Journal of the Asiatic Society for July and August 1839, was occupied with the Gale and Hurricane of 31d to 5th June of 1839, with some theoretical and practical deductions. In the present, I propose to consider the tempests which occurred in the Bay of Bengal, between that epoch and the close of the same year. The first of these is the Gale of 19th to 21st September 1839.

The authorities from which my information respecting it is derived, are the logs and reports of about fourteen ships, Pilot, and Light Vessels, and 10 or 12 reports from inland stations, which have reached me through the Secretary to Government, pursuant to the notice published in the newspapers on 11th September, 1839.

I proceed, as in the first Memoir, to place upon record the materials, abridging them when necessary, after which I shall arrange them in a tabular form for each day, so as to afford thereby at a glance, as well as by the chart, a synoptical view of the progress of the storm.

No. 1.—*Extract from the Log of the H C Steamer "Enterprise,"*
Capt C H. West, in the Bay of Bengal.

Tuesday, 17th Sept 1839 P M Freshening breeze and clear weather. At sunset fresh WSWesterly breeze
 Wind SW to WNW. and cloudy weather. At 10 P M. succession of heavy squalls from SW to WNW with vivid lightning. At 4 A M strong breeze with heavy squalls, throughout the forenoon constant heavy squalls, all sails furl'd, and the engines working from 8 to 10 revolutions. Sun obscured
 Latitude per log, 13° 22' N, longitude per log, 84° 50'

- Wednesday, 18th Sept. 1839.* P M. Fresh gale from the SW
 Wind with a high sea, and the vessel labouring
 very much At 4 P M set the fore topsail, double
 SSW reefed, and the mizen close reefed; sighted a
 brig scudding under her foresail, steering
 to the NE. At sun-set, fresh gale and
 squally. At midnight, increasing gale and
 WNW to SW. cloudy weather, with a rising sea, vessel la-
 bouring much Carried away the wheel ropes,
 rove new ones. At daylight split the fore try-
 sail, lowered it to repair. At 7 A M. set ditto
 again, but close reefed At 8 A M heavy gale,
 West with very high sea At 10½ A.M pitched the
 jibboom in, and carried it away, and on the
 vessel sending to the same sea aft, stove the
 WbN. jolly boat over the stern, filled her with water and
 nearly carried her away altogether, got her in
 over the stern. At noon heavy gales and thick
 cloudy weather, with a high sea Sun obscured
 Latitude per log 13° 14' N., Longitude per log,
 84° 46' E. The engines during this twenty-
 four hours at 5 to 9 revolutions
- Thursday, 19th Sept 1839* P M Unbent fore trysail and
 WNW. bent the new one At 4 P M strong gales with
 heavy squalls and rain. At 6 P.M ditto weather,
 and high sea, drift about 1½ to SW At 9 P.M.
 during a heavy squall, the roping of the new
 fore trysail gave way, lowered it for repair.
 At midnight more moderate, and to all ap-
 pearance the gale breaking. At 1h. 30m A.M. the
 moon set, when the gale raged as fierce as ever
 in heavy squalls At daylight heavy gales,
 with a high topping sea Vessel labouring
 SWb heavily. Close reefed the main sail in case the
 mizen should give way, drift about one mile to
 the NW. At 9 A M. gale increased, with high
 topping sea Noon heavy gale with hard squalls
 and rain. Got the sun between the squalls.

Latitude by observation $13^{\circ} 18' N$, longitude per log, $85^{\circ} 10' E$. Engines working at 6 to 10 revolutions this twenty-four hours

Friday, 20th Sept. 1839. P.M. Heavy gale with very high sea; got a preventer tackle on the fore mast, during the last 16 hours kept vessel close to the wind, with only the mizen set, and the engines working from 6 to 9 revolutions At 8 P.M. more moderate At midnight decreasing gale and clear. A.M. Moderating, but still a heavy sea running. Noon, clear Latitude obs $13^{\circ} 33' N$, long per Chron. $85^{\circ} 35' E$

The 21st 22nd and 23rd P.M. Squally at times, and the sea continued till we approached to within 60 miles of the land The barometer only fell 4-10ths of an inch during the gale At Madras they had no wind, but a very heavy surf and torrents of rain On the 25th we reached Madras, and found every thing smooth During two days after the gale we put the fires out, and set all the sail we could, but the current was so strong to the eastward that we could make no way. We experienced a strong southerly current after leaving Madras, and we heard they had had a very strong gale off Coringa, but I could not learn in what direction.

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*No. 2.—Extract from the Log of the Barque "Isadora," Capt. G. Hodson; along the Coast from Vizagapatam to Calcutta*

On the 15th September, at anchor in Vizagapatam Roads. First, and middle parts light SbW winds and gloomy weather; latter part strong SSW winds and clear.

16th Ditto ditto winds and weather

17th. Steady, and strong SSW. winds, with showers of rain throughout.

18th Ditto moderate NW. winds, veering to NNE and cloudy weather.



19th Ditto NNW winds and dark gloomy weather, with rain Weighed for Bimlipatam

20th. Ditto NNW. winds and cloudy weather

21st Ditto SW., W, and WNW winds, and hazy weather  
Weighed for Calcutta

G HODSON

*No 3.—Abridgment of the Log of the Brig "Spy," Capt C R Smith, from Rangoon towards Calcutta Reduced to Civil time*

*On the 18th September.*—At noon in lat  $18^{\circ} 40'$  N, longitude  $88^{\circ} 48'$  E Light steady breeze at east, with cloudy weather, continuing till midnight Steering to the NNW. and NbW At midnight wind EbN., squally

*19th September.*—At 4 A M threatening appearance to the NE. Daylight, fresh gale EbN. with a swell from the NE At 8h increasing gale, shorten sail at 10h; sounded in 60 fathoms Noon *more moderate*, made sail, heavy swell from the NE, wind EbN lat  $20^{\circ} 36'$  N, longitude  $88^{\circ} 01'$  E P M Moderate breeze, but cloudy, swell from the NE, stood to the eastward At 5 P M, threatening to the NW battened down fore hatches. At 6, heavy thunder and lightning, wind NE, midnight moderate and cloudy, with lightning to the westward Heavy swell from the NE, vessel pitching heavily

*20th September.*—1 A M. Heavy gusts from NW In fore topsail, hove too. 6 A M wind NNW more threatening appearance; gale increasing to noon from the NW; hove too under close reefed main topsail, in 45 fathoms water No observation Latitude by account and soundings  $20^{\circ} 44'$  N, longitude  $88^{\circ} 18'$  E P M. Fresh gale, heavy swell from the northward At 5 P M. having stood to the westward, no ground 70 fathoms. At 10 set the foresail, swell from the northward, much water tumbling on deck with the roll of the vessel Midnight moderate gale and cloudy; swell from the NW.

*21st September.*—4 A M High confused sea; less wind, vessel labouring very heavily. At 5, wind from SW with a heavy sea At 8, no ground 70 fathoms. At 10, soundings in 55 fath-

oms. Noon, fresh breeze and cloudy Lat. obs 20° 53' N., longitude 88° 35' 30" E P M Steady breeze, and heavy swell to the SW. Vessel rolling heavily, and much water washing on board At midnight the Floating Light NEbN.

On the morning of 22nd got a pilot, and stood in with moderate weather

Capt. Smith remarks at the close of his log—" I do not call the weather we experienced during these dates a gale, should I have been outward bound, I am pretty sure that the " Spy" would have gone through it with double reefed topsails, reefed courses, close-reefed boom mainsail, and fore topmast staysail No doubt we should have felt it with this sail, but what I got of it was nothing to speak of, with the exception of a lot of water tumbling in upon our decks, we being deep, and I suppose within the influence of the lateral tides off the Sand Heads at the fall of the freshes, which must have occasioned this My longitudes, I have reason to know, are perfectly correct "

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No 4 —H C. S " *Amherst*," Capt Paterson, at anchor, Kyouk Phoo Harbour Civil time.

18th September, 1839 —At sunset wind south, squally and heavy rain 8 A.M Bar. 30.3, midnight SE light breezes, cloudy and rain.

19th September —A.M. Light breezes SE At 3, a heavy squall At 4, strong breezes ESE. and heavy rain At 8 the same, noon SE. squally and rain. At 3 P M Bar 30.2, sunset to midnight strong breezes and squally

20th September,—A M Strong breezes SE, and squally with rain At 3 a heavy squall from SE with pouring rain. At 4, the same, Bar 30.1 At 8 squally with rain. At noon wind south, more moderate. Sunset, ESE. squally and rain. Midnight, SE. squally and incessant rain.

21st September.—A.M SE. squally, with incessant rain. At 4 the same. At 8 moderate with incessant rain and thunder. Noon, south, moderate incessant rain. Sunset and till midnight cloudy, squally and rain. Bar. 30.

No 5.—*Captain Elson, Master Attendant of Chittagong, in his report of 27th December, says—*

“On the 19th and 20th September we had a severe gale here, which lasted about 24 hours, that is, the severity of it did, it was not accompanied with rain The wind principally held between east and south, veering towards the conclusion to the SW. as all gales do on this coast, when they break up”

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No 6 —*Abridgment of the Log of the Barque “John William Dare,” from Chittagong towards Calcutta Reduced to Civil time*

18th September, 1839. Noon, moderate breezes from the SE, clear weather Lat  $20^{\circ} 36'$  N, long  $90^{\circ} 20'$  E. Bar 29 50 Ther  $86^{\circ}$ . Steering to the SSW and SW. The wind SE. and light, freshening towards midnight At  $11^{\circ} 30'$  squally and rain

19th September —7 A M Hauled up to the westward, wind ENE Noon, strong breezes with passing squalls and showers of rain A heavy sea from the SW., ship rolling heavily Lat obs.  $20^{\circ} 6'$  N., longitude  $88^{\circ} 15'$  E. Bar 29 39 Ther  $86^{\circ}$ . P M Strong breezes, cloudy weather, and a heavy swell from the WSW. At 5-30 Point Palmiras WbN distant 12 miles At 6h 25 fathoms water At 8h heavy thunder and vivid lightning, with a most dismal appearance The Barometer falling, prepared for bad weather At 9h heavy squalls with thunder, lightning, and rain Midnight, heavy gales, in fore topsail.

20th September —8 A.M. Increasing gales from NW Hove too under close reefed main topsail Noon, Bar 29 20. Ther 83 30 Lat by estimation  $20^{\circ} 10'$  N, longitude  $88^{\circ} 10'$  E. P M. Heavy gales from NNW. with showers of rain 4 P.M. gale abating, Barometer rising fast, made some sail Midnight, Bar 29 35.

21st September —Daylight, moderate and fine At noon, Bar. 29.45 Ther.  $86^{\circ}$ .

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No.7.—*Extract from the Log of the Ship “Emerald Isle,” Capt. Saunders.*

For several days previous we experienced constant light, baffling airs, at SW to East, with hot sultry weather.

September, 19th —P. M Lat in $20^{\circ} 41'$ N, long. by Chro $89^{\circ} 27'$ E. moderate breezes, veering at NE. to east, with partial

passing showers Sunset, pleasant breezes and fine weather, with a clear horizon Midnight, increasing breezes 2h. 30m A.M. entered the Eastern Channel with the Floating Light ship bearing $W\frac{1}{2}S$, increasing breezes with light showers, wind as above. Daylight entered the Gasper Channel, wind veering at NE to ENE and dark cloudy weather. 8 A.M. pleasant steady breezes at NE with passing clouds At noon, fresh breezes and cloudy

20th — 4 P.M. Squally, with passing showers, sky bearing a threatening appearance to the north and east At 5h increasing breezes, in topgallant sails, and sent royal yards on deck At 6h blowing very strong in puffs, with a heavy threatening appearance to the north At 6-30 clued up and anchored off Kedgeriee Lighthouse At 7h experienced a very hard squall from NNW. Constant rain and fresh gales from this time up to midnight 2 A.M. squally, with severe gusts at times, less rain, and clouds more dispersed, towards daylight fresh gales and heavy rain Wind at WNW or NW At 8, ditto gales and weather Noon, less rain, but blowing very strong

21st. — 4 P.M. Sky thickening to the NW and no appearance of the gale breaking Sent topgallant yards on deck. Sunset, fresh gales at NW with heavy rain At 8 P.M. wind more westerly, ditto, gales and weather Midnight, wind at west, and the weather somewhat broken, and beginning to brighten up to the westward 3 A.M. Blowing strong at west, but every appearance of fine weather Daylight, pleasant fresh breezes and fine weather At 8 A.M. wind at WSW and a clear sky

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No 8 — *Capt Bond, Master Attendant at Balasore, in his report to Government, says—*

At Balasore on the 18th September, the Thermometer stood at  $87^{\circ}$  Wind SE with slight sleety rain, light breeze

19th. — At  $86^{\circ}$  Wind NE. cloudy, with a fresh breeze.

20th — At  $83^{\circ}$  Wind NW flying clouds and slight rain.

21st. — At  $84^{\circ}$  Wind NW. ditto ditto very slight rain

22nd — At  $87^{\circ} 30'$  Wind SE clearing up in rain

N.B. — Barometer broken

“I was outside in the Roads in the schooner *Oussa* on the 19th September, wind NE. with cloudy weather    Ran over to Piply Finding the breeze freshen, with every indication of a gale, ran back

during the night to Balasore, having treasure on board, and anchored under the lee of the Surtah hills 20th A M wind shifting to the NW. ran for the Chooramun Mud Cloudy, with a threatening appearance, but finding the wind pretty steady, ran again to the eastward, abreast of Piply Continual heavy rain, with strong gusts of wind, till 10 P M when the wind lulled Found a Telinga brig ashore at low water off Balasore On the morning of the 21st wind SE. and clearing up Found on my return to Balasore that the want of rain had injured the crops to the westward of Piply, right south to Pooree; whereas to the eastward of Piply they had abundance of rain, and crops good "

No 9—Ship "*Isabella Cooper*," at anchor at Kedgerree Captain Salmon's note to me, says—

"In answer to your note respecting the weather, the ship *Isabella Cooper* was laying at anchor at Kedgerree with 60 fathoms of chain out, and royal yards up From the 18th to 21st September strong breezes with heavy rain, thunder, and lightning, while blowing fresh, winds from North to NW

J SALMON

*Barometrical observations on board the H C L V "Hope," Capt Hudson at the Inner Station*

| 18th Sept<br>Time | Bar   | Ther | Remarks and Weather                                               |
|-------------------|-------|------|-------------------------------------------------------------------|
| 8 A M             | 29 70 | 81   | Light airs, clearing up                                           |
| Noon,             | , 70  | 87   | Calm Hot                                                          |
| 8 P M             | , 68  | 85   | Moderate Easterly breeze                                          |
| 19th Sept 1 M     | 29 60 | 81   | Moderate NE heavy threatening weather                             |
| Noon,             | , 70  | 86   | Ditto, ditto, Cloudy                                              |
| 4 P M             | , 50  | 86   | { Strong NE breeze, tremendous swell<br>threatening from Eastward |
| 8 P M             | , 52  | 83   | { Unsteady, squally                                               |
| Midnight          | , 52  | 81   | { Frequent gusts at NNE and unsettled<br>weather                  |
| 20th September    |       |      |                                                                   |
| 8 P M             | 29 42 | 80   | { Blowing hard in heavy gusts NNW threa-<br>tening                |
| Noon,             | , 43  | 81   | { Strong NNW breezes with hard squalls do                         |
| 4 P M             | , 32  | 81   | { Continued heavy squalls, constant rain<br>Barometer falling     |
| 8 P M             | , 46  | 80   | Apparently clearing up Bar rising fast                            |
| Midnight          | , 49  | 81   | Ditto, Weather                                                    |
| 21st September    |       |      |                                                                   |
| 8 A M             | 29 53 | 82   | Moderating, frequent squalls from WSW                             |
| Noon              | , 51  | 84   | Fresh WNW breezes, gloomy weather                                 |
| 8 P M             | 61    | 85   | Light SW breezes and cloudy                                       |

Having drawn up the reports from the H C Pilot and Light Vessels in a tabular form, I have printed them so as to give the best view of the Gale along the course of the river to Calcutta

*Tabular view of the Gale of the 19th to 21st Sept., 1839, as experienced along the River, from the Pilot and Light Vessel stations to Calcutta*

| Date             | Vessels' Names | Situation                                                                                   | Wind, Weather, and Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|----------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 19th Sept., 1839 | Saugoi, P V    | Eastern Channel and Saugoi roads,                                                           | First part Light SE breeze and fine weather, noon ENE and cloudy to the eastward, latter ENE light breeze and squally                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                  | Cauvery, P V   | From Bankshall, to near Ked gerce,                                                          | Light breezes and fine weather                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                  | Jane, P V      | A little below Point Jell,                                                                  | Wind from SE by S very light, frequent rain at night                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                  | Hope, F L V    | Inner station, Gasper Buoy WbN Lower Buoy SSE Upper Buoy NbW                                | On 17th Light Southerly and SSE breezes, &c and calms, cloudy to the eastward and lightning to NE and N On 18th 5 A M light squalls NE to East, and constant heavy rain and calms and rain, clearing up Noon, Southerly, calm, hot sultry weather, clouds rising all round Sunset, light variable breezes S to E, clouds to NE a swell on, increasing, 8 P M moderate easterly breezes, tremendous heavy swell setting in from southward and eastward with a strong westerly set Weather assuming an unsettled appearance 9h 30m P M passing squalls, wind all round Midnight moderate NE breezes, heavy clouds all round, passing rain, lightning to the northward and heavy swell |
|                  | Krishna, P V   | Under weigh in the Eastern Channel, & at anchor 9 faths, F L Buoy E $\frac{1}{2}$ S F L EbS | First part light airs and calms, middle, pleasant easterly breeze, latter, freshening easterly breezes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                  | Beacon, L V .. | Outer Station,                                                                              | On the 17th Light SW breezes veering to S and SSE cloudy and lightning At midnight of that day to noon on the 18th varying from SSW round to ESE and becoming squally, at 8 P M increasing breeze from ESE, and at midnight wind veering from NE to ESE with rain and unsettled weather                                                                                                                                                                                                                                                                                                                                                                                             |
|                  | Megna, P V     | Near the Floating Light Buoy, ESE                                                           | First part calms middle, variable from E to ESE cloudy and rain latter, fine weather                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Date<br>Civil time | Vessels' Names | Situation                          | Winds, Weather, and Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------|----------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15th Sept<br>1839  | Saugor, P V    | Kedgeree Roads and Lloyd's Channel | First part pleasant ENE breezes and fine, noon, moderate NNE and fine, latter, heavy squalls ENE to North, heavy rain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                    | Cauterv, P V   | Kedgeree Roads                     | First part Light NNE breeze, increasing to moderate Northerly breeze, and clouds, at midnight squally from NE with rain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                    | Jane, P V      | A little below Point Jella         | Wind from SSE very light, at 8 P M a squall from ENE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                    | Hope F L V     | Inner station as on 18th           | A M Weather clearing up, 4 A M fresh East to NE breezes, with gusts at times, clouds and squall, and heavy swell Daylight, gloomy unsettled weather and moderate at NE, heavy clouds, threatening appearance from E to SE heavy swell continues Noon the same 4 P M strong Northerly breezes, tremendous heavy swell, threatening appearance from East to South Sunset the same, 8 P M moderate Westerly winds ESE to ENE with squalls, gusts of rain, and very unsettled appearance to SE, 126 fathoms cable out, midnight frequent gusts at NNE with dark clouds all round, lightning from West to NW and threatening appearance, swell continuing |
|                    | Krishna, P V   | Under weigh in the Eastern Channel | First part variable from East to ENE, middle and latter NE blowing a moderate gale from NE First and middle part fine weather, latter squally with rain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                    | Beacon, L V    | Outer Station                      | From midnight till noon, fresh to strong ESE breezes, cloudy, and threatening, with rain and a heavy swell from the Eastward, at 4 P M increasing ESE to NE and NNE dark cloudy unsettled appearances to the East, swell continuing — 5 to 8 P M and till midnight, moderate gale blowing hard from E to ENE and NE, heavy squalls of wind and rain, thunder and lightning, all round, swell continuing, vessel pitching and shipping much water, veered to 165 fathoms                                                                                                                                                                              |
|                    | Megna, P V     | Near the Inner Floating Light      | First and middle parts light breezes E to ESE and squall, latter fresh breezes and clouds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Date<br>Civil time | Vessels' Names | Situation                                               | Winds, Weather, and Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------|----------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20th Sept<br>1839  | Saugor, P V    | At anchor Eastern Channel, 8 fathoms Floating Light ENE | First part heavy squalls from Northward to NE with heavy rain Noon hard squalls from N to NW and rain, latter part blowing hard from NW to WSW with rain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                    | Cauvery, P V   | Between Kedgerree and the Lower Floating Light.         | Daylight moderate NE with cloudy weather, noon, strong NE breeze with rain, latter strong NW breezes and rain, midnight, squally with heavy rain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                    | Jane, P V      | At anchor 6 fathoms and proceeding up                   | First and middle parts strong breezes, with squally and heavy rain NE to NNW, latter strong, with rain from N to NW, throughout the day strong gales NE to NW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                    | Hope, F L V    | Inner Station, as on 18th                               | 4 A M strong gusts at North, with dark, cloudy, and very threatening weather all round, passing showers and heavy sea, daylight the same Barometer still falling and blowing hard at NNW with very heavy gusts at times, weather very threatening and heavy sea Noon, strong NNW breezes with hard squalls, rain clearing off, wild, threatening appearances, confused sea 3 P M blowing a gale, with frequent heavy gusts and constant rain, made all snug for a gale 4 P M continued heavy squalls and constant rain, Bar still falling, 180 fathoms cable out 6 P M the same weather, clearing a little Bar rising fast Midnight the same weather, and very heavy sea |
|                    | Krishna, P V   | At anchor 9½ fathoms F I N EbbE                         | First part NNW, middle and latter, NW, blowing a moderate gale, with heavy squalls and rain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                    | Beacon, F L V  | Outer Station,                                          | 4 A M Gale continuing blowing hard from ENE to NNE with heavy squalls of wind and rain, very unsettled appearance, and heavy swell 4 A M the same 8 A M gale continuing blowing hard from NNE and NW heavy squalls Noon, gale continuing NNW & WNW with heavy squalls 4 P M gale continuing from WNW 8 P M do, midnight the same from WNW blowing hard squalls of wind, light showers and cloudy weather                                                                                                                                                                                                                                                                 |
|                    | Megna, P V     | At anchor F L bearing SSW                               | Throughout hard breezes from N to WNW and cloudy, with heavy rain at intervals                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |



| Date<br>Civil time | Vessels' Names | Situation                                                                         | Wind, Weather, and Remarks                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|----------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 21st Sept<br>1839  | Saugor, P V    | Reef Buoy NWbW, and latterly<br>Saugor Light East, in 9 fathoms                   | First part fresh WSW to SW breezes and squalls, with rain, noon, moderate WSW and fine, latter, light SW breeze and fine weather                                                                                                                                                                                                                                                                                                           |
|                    | Cauver, P V    | Eastern channel, Floating Light<br>E½S 9 fathoms                                  | SW breeze and fine weather                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                    | Jane, P V      | Off Bank-hall                                                                     | First and middle part strong breeze and rain, WNW to SW, latter moderating                                                                                                                                                                                                                                                                                                                                                                 |
|                    | Hope, F L V    | Inner station as 13th                                                             | 4 A M Wind shifted to West, blowing hard at times Day light, blowing hard in gusts, with threatening appearances SE to SW with lightning &c weather moderating, heavy squalls WSW, heavy sea Noon fresh WNW breezes with cloud v and gloomy weather, 8 P M light SSW breeze, unsettled appearance all round, lightning to the westward, sea moderating, midnight light SSW breezes, clouds, unsettled At 4 A M 22d, fine weather, wind WSW |
|                    | Krishna, P V   | Under weigh on the Eastern reef<br>and at anchor upon it, in 7½ fathoms, F L east | 2 A M Wind shifted to WSW, weather moderating, first part fresh WSW winds and cloudy and hazy weather, middle, moderate westerly breeze and fine, latter, light westerly breezes and fine                                                                                                                                                                                                                                                  |
|                    | Beacon, F L V  | Outer Station                                                                     | 1 M Gale continuing, blowing hard from WNW in heavy squalls of wind and light showers of rain 4 A M Do of gale broke, with a fresh WSW breeze and fine, swell continuing, noon, moderate, WSW and fine weather, 8 P M light WSW to SW Midnight, light SW breezes                                                                                                                                                                           |
|                    | Megna P V      | Under weigh on the Eastern reef                                                   | First and middle part fresh breezes from W to SW and cloudy, latter light airs from S to SSW and fine                                                                                                                                                                                                                                                                                                                                      |

*At Calcutta*

The following observations on the Gale, as it occurred at Calcutta, are my own, taken in a rather confined situation in Park Street, Chowringhee. The barometrical observations are my own and those of the Surveyor-General's Office, my barometer being corrected to the standard one.

*Sept 19th*—4 P M Bar 29 48 The day mostly calm, hot, and cloudy, towards evening heavy dark *cumuli* and *nimbi* to the eastward, with lightning at times. 9 P M Bar 29 47, wind ENE dark gloomy weather, drizzling rain, and low moaning breeze throughout the night, with squalls and rain at times.

*September 20th*—6 A M Wind NE Bar 29 44 Dirty drizzling weather, with a sighing undulating wind. 10 A M Wind NNE Bar 29 45, heavy rain and strong squalls at times. Noon, NNE to NE Bar 29 37 Strong squalls and rain, heavy scud flying from the NE. 2 P M NNE Bar 29 33 Squalls, but almost calm at intervals, with heavy gusts, and rain. 5 P M Wind north Bar 29 33 Strong gale and heavy rain. 6 P M NNW Heavy squalls and rapid scud from NW. 7 P M Calm Bar 29 34 At 9, wind NNW Bar 29 37 P M Strong squalls and rain. *Midnight*, NW with heavy gusts and rain.

*September 21st*—5 A M SW Bar 29 43 Squalls and rain. 9 A M SW Bar 29 49 Clearing up. 11 A M Calm. At noon the gale terminated. Bar 29 50, drizzling rain and squally from W and SW.

Throughout this Gale the clouds were always, so to speak, before-hand with the wind below them. When the wind was at NE the clouds were moving from NNE, and by the time the wind arrived at North, or very little to the west of it, the scud was flying from NNW or NW, and again from West, or nearly so while the wind was yet at NW shewing that the centre of the vortex above (if it was a vortex) was further advanced than its position on the earth.

*Meteorological Observations at the Surveyor General's Office,  
Calcutta*

*Thursday, the 19th September, 1839.*

| Time          | Bar    | Mer  | Air  | Evpg<br>Sur | Wind | Aspect of the Sky              |
|---------------|--------|------|------|-------------|------|--------------------------------|
|               | Inches |      |      |             |      |                                |
| Sunrise       | 29 600 | 80 5 | 80 0 | 79 8        | E    | Generally clear                |
| At 9h 50m     | 630    | 85 6 | 87 9 | 84 9        | E    | Cumuli, or stacked clouds      |
| Apparent noon | 616    | 87 9 | 90 1 | 84 9        | NE   | Cumuli                         |
| At 2h 40m     | 512    | 86 4 | 90 0 | 85 0        | N    | Very cloudy                    |
| At 4 P M      | 480    | 85 5 | 88 9 | 85 0        | W    | Cloudy                         |
| Sunset        | 478    | 84 2 | 85 8 | 83 3        | E    | To the E Nimbi, or rain clouds |
| Rain          |        |      |      |             |      | Inches                         |

N B —The rain which fell on the 18th, was noted on the 19th at noon

*20th September, 1839*

| Time          | Bar    | Mer  | Air  | Evpg<br>Sur | Wind | Aspect of the Sky                       |
|---------------|--------|------|------|-------------|------|-----------------------------------------|
| Sunrise       | 29 130 | 79 0 | 77 0 | 77 0        | NE   | Overcast, rainy, and squally            |
| At 9h 50m     | 446    | 80 5 | 77 9 | 77 1        | N    | Overcast, squally & smart rain          |
| Apparent noon | 375    | 80 0 | 78 1 | 77 5        | NE   | Drizzly and squally                     |
| At 2h 40m     | 333    | 80 1 | 78 0 | 77 1        | N    | Overcast, rain, and squally             |
| At 4 P M      | 333    | 79 8 | 77 6 | 76 9        | NW   | Blowing a gale with incessant rain      |
| Sunset        | 339    | 79 0 | 77 0 | 76 6        | NW   | { Blowing a gale (but rather moderate,) |
| Rain          |        |      |      | ..          |      | Inches 2 62 of the 19ths                |

*21st September, 1839*

| Time          | Bar    | Mer  | Air  | Evpg<br>Sur | Wind      | Aspect of the Sky            |
|---------------|--------|------|------|-------------|-----------|------------------------------|
| Sunrise       | 29 426 | 78 5 | 76 0 | 76 0        | Very High | Cloudy                       |
| At 9h 50m     | 491    | 80 7 | 81 2 | 78 5        | W         | Cloudy                       |
| Apparent noon | 499    | 80 7 | 79 5 | 77 5        | High      | Raining                      |
| At 2h 40m     | 490    | 80 5 | 79 9 | 77 0        | SW        | Cloudy                       |
| At 4 P M      | 486    | 80 5 | 79 5 | 77 0        | SW        | Cloudy                       |
| Sunset        | 496    | 80 0 | 78 8 | 76 5        | SW        | Cirro strati, or vein clouds |
| Rain          |        | ..   |      | .           |           | Inches 4 32 of the 20ths     |

We now arrive at the more inland stations, and as the tempest seems to have travelled from the mouths of the Megna, inland, towards Rungpore, I have, to enable the reader better to trace it, begun at Burnisaul, in lat. 22° 35', long 90° 22', near the spot

where the Megna enters the Bay of Bengal, on its Eastern bank, from which place I have a letter from R. Ince, Esq. Superintendent of Salt Chokies.

*From R Ince, Esq Burrisaul, Lat 22° 35' N. Long 90° 22' E.*

19th September, 1839 — At 4h 40m P M a gale commenced from the SE., it blew for half an hour, then ceased for an hour, when it began again, and continued all night. During the 20th the wind got more round to the east, and blew with great violence until past midnight, when it settled at south, and gradually cleared up, the wind having veered round to the west on the morning of the 21st. The gale was at its *utmost* between 11 and 12 on the night of the 20th

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Following now, as nearly as possible, the course of the river on both banks, we have successively the following reports, mostly received from the officers of government at the different stations by Mr Secretary Pimsep, in pursuance of the public notification inserted in my first memoir

*Report from Mr. Assistant Surgeon E. Foakes, dated Comilla, September 28th, 1839*

*Latitude 93° 28' N Longitude 91° 2' E*

On the 19th of September 1839, after a very hot day, thermometer standing at 89°, we were visited about half past four P M by a heavy squall of wind, attended with torrents of rain, thunder and lightning, but not very severe. At first it came from the north, but shifted round suddenly to the south, and blew very hard for two hours, the wind then abated, but the rain continued all night, and in showers the following day, the wind was from the south, but not very high, it again rose in the evening and blew very hard from SEbS occasionally shifting round to the east

21st — 6 A.M The wind still continues to blow from the same quarter in squalls, attended with heavy showers of rain — Still blowing from the same quarter 6 P M The wind began to lull about this time, and gradually died away, blowing lightly from the southward

*From Dr. G. Lamb of Dacca. Lat 23° 42' N Long 90° 17' E.  
Register of the Barometer and Wind at Dacca from 18th to 23rd September, 1839*

| Sept 1839 | Barom<br>at 10 A M | Barom<br>at 3 P M | Barom<br>at 10 P M | Ther<br>attached<br>10 P M | Do outside<br>at 10 P M | Remarks                                                                                                                                                                                                                                                                                                                                              |
|-----------|--------------------|-------------------|--------------------|----------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18th      | 29 91              | 29 82             | 29 83              | 85                         | 84                      | Calm, or a gentle breeze from East and SE Cloudy in all quarters                                                                                                                                                                                                                                                                                     |
| 19th      | 29 84              | 29 70             | 29 63              | 84                         | 82                      | Forenoon Calm dense numbr in the E and SE At 7 P M a heavy squall from the East for half an hour, followed by rain all night Gentle breeze from NE and ENE Rain measured at 10 P M 1 1                                                                                                                                                               |
| 20th      | 29 56              | 29 43             | 29 48              | 81 5                       | 80                      | Wind NE moderate rain, heavy clouds 1 P M Heavy rain, wind gentle from NE 2 to 4 P M Heavy rain, wind in squalls from NE, rain ceased at 5 P M Wind increasing from ENE 6 Hard squalls, no rain, wind ENE 10 P M Wind EbN with frequent squalls all night Rain 2 8                                                                                   |
| 21st      | 29 51              | 29 56             | 29 64              | 81                         | 80                      | 21st 3 A M Blowing hard with heavy rain, wind SE very heavy squalls till 6 A M when the rain ceased, and the wind abated slightly 7 to 9 A M Occasional squalls from SSE 10 to 12 wind SEBS fresh with squalls and rain Noon, wind S fresh with squalls to 4 P M Wind SbW abating 6 P M Wind SbW moderate, evening fine 10 P M Wind SE gentle rain 2 |
| 22nd      | 29 73              | 29 69             | 29 74              | 81 5                       | 81 5                    | 22nd Fine weather, wind SE                                                                                                                                                                                                                                                                                                                           |
| 23rd      | 29 78              | 29 69             | 29 73              | 84                         | 83                      | 23rd Ditto, Ditto                                                                                                                                                                                                                                                                                                                                    |

*Report by Dr. Sullivan, 36th Regt N I, from Jumalpoore  
Lat. 24° 58' N., Long. 82° 58' E*

On the night of the 20th instant, this station was visited by a severe storm, which continued throughout the night without abatement, and in a diminished rate for the whole of the next day. The wind set in from the eastward at about 5 P.M. from which point it continued to blow, with but slight deviation to the southward, was accompanied by heavy rain, but no thunder or lightning, and came in frequent and tremendous gusts, it gradually reached its utmost violence at about midnight.

For several days previously, the weather was unusually sultry, with a clear sky, and scarcely a breath of air stirring. Thermometer 86° at noon; from which it suddenly fell to 78° on the day of the storm, and has scarcely exceeded that range since.

Jumalpoore stands on the western bank of the Burhampooter river, is pretty clear of heavy tree jungle in its vicinity, the nearest hills are distant about 50 miles, in a nearly due north direction, the prevailing wind is easterly, which blows for nine months in the year.

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Report from Jumalpoore, by Lieut C. W. Tripp, 30th Regt N I

September 19th. The weather all day hot, the sun bright, evening close and sultry, at 9 P.M. a few clouds raking over the moon, at 10 they had accumulated, and a breeze springing up from the SE. increased and freshened during the night; rain at 11 P.M. and rain continuing on the early part of the morning of the 20th—Fresh breezes and cloudy weather, with showers at intervals, the wind sometimes lulling into dead calms until 4 P.M., when the wind commenced to blow strong and steadily from NNW accompanied with rain, and so continued for some hours. During the night it shifted round to SE. and blew a gale with constant rain, wind veering about between two or three points to either side of SE, and coming on with occasional gusts much harder than others. This continued all day of the 21st, with slight variations, though with some occasional appearances of an abatement. Ther 78° in the

verandah At 7 P.M. the storm for a short time appeared to be renewing its energies At 10 P.M. the wind had got round to nearly due west, and was evidently falling Rain heavier than at any other period 22nd At daybreak nearly a calm

General Observations.—This storm, as felt here, can be considered as only a moderate one, having injured but a few houses that had roofs, and blown down only such trees as had previously been in nearly a falling condition No thunder nor lightning at any period of the storm

Memorandum.—The River Dâk from Assam, due on the 22nd arrived this day, the 24th, from which it is to be presumed the storm higher up the Buthampooter river had caused delay to the boats

Report by Mr. Deputy Collector Smart, Jungypore

Lat 24° 28' N Long 88° 13' E.

A severe gale occurred at this place, Friday, 20th September, 1839 6 A.M. Wind easterly, blowing in irregular gusts, weather very cloudy, occasional drizzling Noon, not blowing so strong, drizzling 5 P.M. Wind veered to NE. blowing in strong gusts, drizzling. Midnight, blowing very violently from NNE. accompanied with torrents of rain. Continued blowing from the same point, with unabated fury, till 6 A. M. of the 21st

Saturday, 21st—6 A.M. Wind veered to north, violence somewhat abated, still raining very heavily 10 A.M. Blowing furiously again Noon, wind somewhat abated, but still raining. 4 P.M. Wind veered to NNW. blowing very strong. 7 P.M. Wind somewhat abated 10 P.M. Blowing from NW. in subdued gusts, still raining Midnight, wind dying away

Sunday, 22nd.—6 A.M. A gentle breeze blowing from the south There was a total absence of thunder and lightning, and this is a feature remarkable in every regular gale.

The following is an extract from a letter dated Moorshedabad,

Lat 24° 11' N Long 88° 15' E., 24th September, 1839

“The regiment was detained here for a couple of days, by a very severe storm, which commenced on Thursday night, 19th

Sept. and continued, without intermission, till 9 o'clock, P.M. on Saturday the 21st It first blew from the SE. then the E. ; shortly after from the NE., when there was a lull for about half an hour, the rain falling absolutely in torrents. It then commenced to blow hard from the north, and towards daybreak on Saturday morning, it veered round to the north-west, and continued so all day, with tremendous gusts of wind and rain every now and then It is said that several lives have been lost in the city and neighbouring villages, by the falling-in of houses, and I fear we shall hear of much mischief on the river, ere long"—*Hurkaru 29th September*

~~~~~  
STORM—We hear that during a storm which took place at Rampore Bauleah on the 21st instant, the whole fleet of boats belonging to the establishment of the Superintendent of Police in the Lower Provinces was completely wrecked,—most of them foundering before the occupants could save the most trifling articles. The fleet consisted of pinnaces, budgeiows, and beaulcahs The greatest sufferers are Mr Smith himself, Messrs Huttimann, Thompson, Potter, and Hodgson, Dr. Ren-nyk, and the Shershtadai The whole party were,—after the storm, in which, happily, no lives were lost—received into the circuit house, and treated by the civil officers with characteristic kindness.—*Englishman 29th September*

• ~~~~~  
*Report from Wm Bell, Esq Officiating Joint-Magistrate of Mal-dah Lat. 25° 3'. Long 88° 4'*

On Thursday\* afternoon, 20th Sept it rained heavily, and at about 5½ P.M. began blowing hard from the north, ranging between the north and north-west points ; it continued, attended with heavy rain, the whole night and the next day, increasing until about 3 P.M. of the 21st, and abating gradually till 10½, when both rain and wind ceased

I am indebted to Dr Edlin, for his observations of the thermometer, which fell as low as 79° Faht. having stood steadily for several weeks at 84°, 85°, 86°, and only on one or two

\* NOTE—Friday in the MS which is evidently an error, since Friday is the 21st, mentioned subsequently



occasions in the last three months, was marked as high as  $89^{\circ}$  in the shade

I am sorry to say, neither of us possess a barometer, so that I am not able to offer any remark upon it. The following day was very close and warm; and a very considerable quantity of rain fell, and great damage was done by the wind

*Dr Edlin's register of the Thermometer at Maldah*

| Sept 1839 | Before Sunrise  | 10 A M | Noon            | 4 P M | Evening         | Rain |
|-----------|-----------------|--------|-----------------|-------|-----------------|------|
| 18th      | 82              | 85     | 87              | 90    | $85\frac{1}{4}$ |      |
| 19th      | $82\frac{1}{4}$ | 86     | 89              | 92    | 87              |      |
| 20th      | 80              | 80     | 80              | 81    | 78              | 1 1  |
| 21st      | 79              | 80     | $82\frac{1}{2}$ | 84    | 80              | 2 8  |
| 22nd      | 79              | 84     | 85              | 87    | 84              | 2    |
| 23rd      | 80              | 84     | 85              | 87    | $83\frac{1}{4}$ |      |

*Report from Chilakhal, about 12 miles NW of the station of Rungpore. By C W Russell, Esq Civil Service.*

*Lat about  $25^{\circ} 53'$ , Long  $89^{\circ} 00'$*

At daybreak on the 20th instant, the sky became overcast and wild. At 10h 30m A M a storm commenced from NE. accompanied by rain, and continued, with about the same degree of strength, until 1 A M. of the 21st, when it lulled, then recommenced from the same quarter (NE) increasing in violence until 8. A.M., from which time until 10 A M. it blew exceedingly hard, with violent gusts at intervals, the wind during these two hours continually shifting between N and NE. It now moderated slightly, until 2 P.M from which hour until 1h 30m on the 22nd (when it suddenly ceased) it raged with the greatest violence, shortly afterwards, the wind went round to SW and continued in that quarter until 3h. 50m P M, when it went back to NE with every appearance of a recurrence of the storm

It is difficult to say precisely when the storm was at its greatest height, but I am inclined to think it was between the hours of 8 and 10 A M of the 21st, and the last hour of its continuance

*Variations of the Thermometer*

|             |    |              |            |    |       |
|-------------|----|--------------|------------|----|-------|
| 20th 8 A M  | 86 | } Wind<br>NE | 21st 1 A M | 79 | } NE  |
| 11          | 81 |              | 6          | 76 |       |
| 12 Noon     | 81 |              | 8          | 75 | } NE. |
| 2 P M       | 80 |              | 10         | 75 |       |
| 4           | 80 |              | 12 Noon    | 76 | } NE. |
| 6           | 80 |              | 2 P M      | 76 |       |
| 8           | 79 |              | 4          | 76 |       |
| 10          | 79 |              | 6          | 76 |       |
| 12 Midnight | 79 |              | 8          | 76 |       |
|             |    |              | 10         | 76 |       |

22nd 1h 30m      77 NE.

The time the storm ceased

|          |    |      |
|----------|----|------|
| 5        | 75 | } SW |
| 6        | 76 |      |
| 8        | 75 |      |
| 12 Noon. | 78 |      |
| 4 P M    | 80 | } NE |
| 5        | 75 |      |
| 5        | 75 |      |

Chilakhal on the South bank of the  
Teestah, 12 miles NW of the Civil station  
of Rungpore }

C W RUSSELL

The storm mentioned in the following report, though it is not connected with ours as a gale of wind, may possibly be so in an electrical point of view, for it will be remarked, that while in general the vessels and stations within the influence of the turning gale, experienced but little thunder and lightning, this storm was, on the contrary, almost a perpetual discharge of it, as if the electric fluid had been generated by the vortex, conducted along the Himalayan chain, and discharged at Dadoopoor?

To H. T. PRINSEP, ESQUIRE, *Secretary to Government.*

SIR,

*Dadoopoor, September 30th, 1839*

In compliance with general orders of the 11th current, I have the honor to forward some particulars regarding a storm which occurred here during the night of the 20th, and morning of the 21st instant. The observations were made by the Canal Overseer stationed at this place, Conductor W. Dawe, whose words I quote, and have merely to add my testimony to their correctness

The Canal station of Dadoopoor is situated below the junction of the Somlie and Putteallee rivers with the Jumna, on the right bank of the latter, lat 30° 12' N. and long. about 77° 23' 45" E., about 16 miles from the southern base of the Sub-Himalayas

Extract from Mr Dawe's Report—

"The evening of the 20th was clear, with a light easterly wind, the fore part of the night; moon light, without a cloud About 11h. 30m. P M. distant lightning was perceptible in the NW quarter, and about midnight, thunder was heard in the same direction. At 1h 30m A M of the 21st, the storm came on in sudden gusts, accompanied by a continual roll of thunder and vivid streams of lightning and rain, driven along with great force, nearly parallel to the earth The latter only continued for about half an hour,\* but the storm did not totally subside till about 3 A M, when it fell a dead calm, and towards daylight the sky was quite clear, with light airs from the eastward The direction the storm took was from the NW to the SE This storm appears to have been more extensively felt, than those which generally occur in this neighbourhood By reports which I have received, it appears the same ravages have been extended as far down as Kurnaul, and upwards from this to the foot of the lower Hills, (as I have personally observed) There appears to have been no abatement in the force of the storm, for I witnessed in my route yesterday (to the Canal head) trees of immense size torn up by the roots."

I append an extract from the Meteorological Register kept here, from the 18th to the 24th instant, inclusive

I have directed the attention of the Overseers employed under my orders at Kurnaul, Hansi, and Delhi, and two intermediate stations, to the registry of storms, and on the occurrence of such phenomena I will do myself the honor to forward a combined report of their observations

I have the honor to be, &c

W. E. BAKER, *Lieut. Engineers*  
*Superintendent Delhi Canal*

\* The quantity of rain which fell during this storm was 0.91 inch



The following tables will show, as nearly as can be collected from the preceding documents, the state of the wind and weather at noon over the whole extent which they embrace, and from it the course of the gale upon the chart has been deduced.

*Tabular view of the Gale between 18th and 21st September 1839, at Noon*

| Date,<br>Civil time        | Names of Vessels & Places  | Winds and Weather.                                                  | Lat N | Lon E | Bar   | Ther | Remarks                                                  |
|----------------------------|----------------------------|---------------------------------------------------------------------|-------|-------|-------|------|----------------------------------------------------------|
| Noon,<br>18th Sept<br>1839 | H C Str Enterprise,        | SW Fresh gale veering to the Westward by 19th, . . .                | 13 22 | 84 50 |       |      | Gale increasing, and sea rising                          |
|                            | Bark Isadora, . . .        | NW moderate, veering to NNW                                         | 17 40 | 83 29 |       |      | { Cloudy weather at Vizagapatam.                         |
|                            | Brig Spy, . . .            | Steady breeze, East and cloudy,                                     | 18 40 | 88 48 |       |      | { At anchor in Kyouk Phyo, Harbour                       |
|                            | H C S Amherst, . . .       | Southerly breeze, . . .                                             | 19 26 | 93 34 | 30 3  |      | { Standing to the SSW and SW from Chittagong to Calcutta |
|                            | John William Dare, . . .   | Moderate from SE clear weather . . .                                | 20 36 | 90 20 | 29 50 | 86   | { No Log for this day                                    |
|                            | Emerald Isle, . . .        | Light winds SW to East, . . .                                       | 21 28 |       |       | 87   | { At anchor Outer Station                                |
|                            | At Balasore, . . .         | SE wind Slight rain, . . .                                          | 21 04 | 127   |       |      | { At anchor Inner Station                                |
|                            | Beacon Light Vessel, . . . | ESE squally, . . .                                                  | 21 04 | 127   | 22 70 | 87   | { Eastern Channel and Saugor roads                       |
|                            | Hope Light Vessel, . . .   | Southerly calms hot and sultry, . . .                               | 21 26 |       |       |      | { Ditto ditto.                                           |
|                            | Saugor, P V, . . .         | ENE, . . .                                                          |       |       |       |      | { At anchor near the Inner Station                       |
|                            | Krishna, P V, . . .        | Pleasant Easterly breezes, Variable from ESE cloudy and rain, . . . |       |       |       |      | { At anchor below Point Jelly                            |
|                            | Megna, P V, . . .          | Very light SEbE breezes, . . .                                      |       |       |       |      | { Cloudy to the Eastward                                 |
|                            | Jane, P V, . . .           | No report for the 18th, wind NE                                     | 22 35 | 90 23 | 29 61 | 0    |                                                          |
|                            | At Calcutta, . . .         | No report for the 18th, . . .                                       |       |       |       |      |                                                          |
|                            | Burrissaul, . . .          | No report of wind and weather for the 18th . . .                    | 23 28 | 91 02 |       |      |                                                          |
|                            | Commullab, . . .           | Calm or gentle breeze from East or South, . . .                     | 23 42 | 90 17 |       |      |                                                          |
|                            | Dacca, . . .               | No report, . . .                                                    | 24 28 | 88 13 | 29 86 | 87   |                                                          |
|                            | Jungypore, . . .           | No report, . . .                                                    | 24 58 | 89 48 |       |      |                                                          |
|                            | Jumalpoore, . . .          | No report, . . .                                                    |       |       |       |      |                                                          |

| Date<br>Civil time          | Names of Vessels and Places                         | Winds and Weather                                                                                  | Lat N | Lon E | Bar.  | Sump | Ther | Remarks                                                             |
|-----------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------|-------|-------|-------|------|------|---------------------------------------------------------------------|
| Noon,<br>19th Sept.<br>1839 | H C Steamer Enterprise, ..                          | Heavy gale, SW                                                                                     | 0 7   | 0 7   |       |      |      | { High topping sea,<br>{ squalls and rain                           |
|                             | Bark Isadora, . . . . .                             | Moderate NNW winds and<br>gloomy weather,<br>Ebn gale but more moderate<br>than before,            | 13 18 | 85 10 |       |      |      | Left Vizagapatam roads                                              |
|                             | Brig Spy, . . . . .                                 | SE squally and rain,<br>ENE strong breezes and passing<br>squalls,                                 | 17 40 | 83 28 |       |      |      | { Threatening to the NE<br>{ but moderating at noon                 |
|                             | H C S Amherst,<br>John William Dare, . . .          | NE fresh breezes and cloudy, .<br>NE fresh breezes and cloudy, .                                   | 20 36 | 58 01 |       |      |      | { At anchor in Kyouk<br>{ Phycos harbour                            |
|                             | Emerald Isle,<br>At Balasore, . . . . .             | Strong, increasing LSE breezes,<br>cloudy and rain                                                 | 20 06 | 88 15 | 20 39 |      | 86   | A heavy sea from the SW<br>In the Gasper Channel                    |
|                             | Kedgerie,<br>Beacon, L V . . . . .                  | Moderate NE threatening wea-<br>ther, . . . . .                                                    | 21 04 | 88 27 |       |      |      | { Heavy swell from the<br>{ eastward, thig weather                  |
|                             | Hope, L V . . . . .                                 | Moderate NE breeze and fine,<br>Moderate gale from NE,                                             | 21 26 | 88 07 | 29 70 |      | 86   | { Threatening to E. and<br>{ S E heavy swell.                       |
|                             | Saugor, P V<br>Krishna P V<br>Megna, P V . . . . .  | Light breezes E to LSL and<br>squally,                                                             |       |       |       |      |      | Kedgerie roads<br>Eastern Channel                                   |
|                             | Jane, P V<br>Cauvery, P V<br>At CALCUTTA, . . . . . | Light winds from SSE, . . .<br>Moderate northerly breezes & cloudy<br>Hot sultry calms, NE airs, . | 22 34 | 88 22 |       |      |      | At anchor near the F L<br>Off Point Jelly<br>Kedgerie Roads         |
|                             | Burnsaul, . . . . .                                 | Hot sultry weather,                                                                                | 22 35 | 90 22 |       |      |      | { Threatening to the East<br>{ Gale commenced at 4<br>{ P M from SE |
|                             | Commallah, . . . . .                                | Hot sultry weather,                                                                                | 23 28 | 91 02 |       |      | 89   | { Heavy squall at half<br>{ past 4 P M                              |
|                             | Dacca, . . . . .                                    | Hot sultry and calms, . .                                                                          | 23 42 | 90 17 | 29 77 |      |      | { Threatening to the<br>{ East, squalls at 7 P M                    |
|                             | Jumulpore, . . . . .                                | Hot clear weather, . . .                                                                           | 24 58 | 89 58 |       |      |      | Breeze from SE, 10 P. M                                             |

| Date,<br>Civil time | Names of Vessels and Places                                                                                                                                | Winds and Weather                                                                                                                                                                                                                                                                                                                                  | Lat N                            | Lon E                            | Bar            | Smp | ther           | Remarks                                                                                                                                                                                                                       |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|----------------|-----|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10th Sept<br>1859   | H C Steamer Enterprise,<br>Bark Isadora, ..<br>Brig Spy, ..                                                                                                | SWBS decrsd gale fine & clear,<br>NNW cloudy weather, ..<br>Gale from NW and threatening,                                                                                                                                                                                                                                                          | 0 1<br>13 33<br>17 50            | 0 1<br>85 35<br>83 35            |                |     |                | Gale had terminated by noon<br>At Bimilapatam<br>Hove too under close reefed<br>main topsail in 45 mins with<br>squalls from SE veering to<br>S at noon In Kyouk Phyo<br>Harbour                                              |
|                     | H C S Amherst, ..                                                                                                                                          | South, rainy and squally,                                                                                                                                                                                                                                                                                                                          | 19 20                            | 93 34                            |                |     |                | Hove too under close reefed<br>main topsail                                                                                                                                                                                   |
|                     | John William Dare, ..<br>Emerald Isle, ..<br>At Balasore, ..<br>Beacon, Light Vessel, ..<br>Hope, Light Vessel, ..                                         | Heavy gales NNW with rain, ..<br>Blowing strong WNW to NW.<br>NW flying clouds and rain, ..<br>Gale about NW heavy squalls, ..<br>NNW Strong breezes with hard<br>squalls, ..                                                                                                                                                                      | 20 10<br>21 04<br>21 26          | 88 10<br>88 27<br>88 07          | 29 23<br>29 13 |     | 85<br>83<br>80 | At anchor off Kedgeree<br>strong gusts at times from NW<br>Varying NNW to WNW<br>Confused sea & threat ap-<br>pearance, increase to a gale<br>at anchor Eastern Channel<br>At anchor near Floating Light<br>Ditto ditto ditto |
|                     | Saugor, P V. ..<br>Krishna, P V ..<br>Magna, .. ..<br>Jane, P V ..<br>Cauvery, P V ..<br>At Calcutta, ..<br>Burrsaul, .. ..<br>Commallah, ..<br>Dacca, ... | Hard squalls N to NW and rain<br>NW blowing moderate gale<br>heavy squalls and rain, ..<br>Hard breezes N to NNW with<br>heavy rain at intervals,<br>NNW Strong breezes sq & rain,<br>Strong northerly breezes and rain,<br>NNE to NE Strong sq & rain,<br>Blow with violence (about ENE)<br>Moderate gale about south,<br>NE moderate and rain .. | 22 34<br>22 35<br>23 28<br>23 42 | 88 22<br>90 22<br>91 02<br>90 17 |                |     |                | At anchor<br>Between Kedgeree & the F L.<br>Moderating about noon,<br>Midnight NNE blowing<br>violently and heavy rain                                                                                                        |
|                     | Jungypore, ..<br>Morsheadabad, ..<br>Malda, ..<br>Jumalapore ..<br>Rungpore Chilahkal,                                                                     | Easterly in irregular gusts,<br>Raining, wind not noticed,<br>Fresh gale from E to SE, ..<br>NE gale with rain, ..                                                                                                                                                                                                                                 | 25 03<br>24 58<br>25 46          | 88 04<br>80 58<br>88 44          |                |     |                | Gale from about NN Wat 6 1/2 PM<br>Reports not very distinct<br>Gale began at 10h 30m AM                                                                                                                                      |

| Date,<br>Civil time.       | Names of Vessels and Places              | Winds and Weather                                               | Lat N | Lon E | Bar   | Simp | Ther | Remarks                                                   |
|----------------------------|------------------------------------------|-----------------------------------------------------------------|-------|-------|-------|------|------|-----------------------------------------------------------|
| Noon<br>21st Sept<br>1839. | H C Steamer Enterprise,<br>Bark Isadora, | About WSW squally at times,<br>Westerly winds and hazy weather, | 14 47 | 83 56 |       |      |      | At Bimulapam<br>Heavy swell from SW                       |
|                            | Brig Spy                                 | Fresh breeze (SW) cloudy,                                       | 17 50 | 83 35 |       |      |      |                                                           |
|                            | H C S Amherst,                           | South, moderate incessant rain,                                 | 20 53 | 88 35 |       |      |      |                                                           |
|                            | John William Dare,                       | Moderate and fine weather,                                      | 19 26 | 93 34 |       |      |      | At anchor, Kedgerree                                      |
|                            | Emerald Isle,                            | WSW clear sky,                                                  |       |       |       |      |      | { 4 A M gale broke with<br>fresh WSW breezes              |
|                            | At Balasore,                             | Wind SE slight rain,                                            |       |       |       |      | 84   |                                                           |
|                            | Beacon L Vessel,                         | Moderate WSW breeze and fine,                                   | 21 04 | 88 27 |       |      |      |                                                           |
|                            | Hope Light Vessel,                       | Fresh WNW breeze and gloomy<br>weather, ..                      | 21 56 | 88 07 | 29 51 |      | 84   | Near the Reef Buoy                                        |
|                            | Saugor, P V.                             | Moderate WSW and fine, ..                                       |       |       |       |      |      | On the Eastern reef                                       |
|                            | Krishna, P V,                            | Moderate Westerly breeze and<br>fine, ..                        |       |       |       |      |      | Ditto ditto ditto                                         |
|                            | Megna, P V                               | Fresh breezes West to WSW                                       |       |       |       |      |      | Off Bankshall                                             |
|                            | lane, P V                                | About West, moderate                                            |       |       |       |      |      | Eastern Channel                                           |
|                            | Caurey, P V                              | SW breezes and fine                                             |       |       |       |      |      | { Gale terminated about<br>noon                           |
|                            | At CALCUTTA,                             | Squally from West and SW diz-<br>zing rain, ..                  | 22 34 | 88 22 |       |      |      |                                                           |
|                            | Burraul,                                 | About West moderate, ..                                         | 22 35 | 90 22 |       |      |      |                                                           |
|                            | Commillah,                               | S Easterly rain, thunder and light-<br>ning, ..                 | 23 28 | 91 02 |       |      |      |                                                           |
|                            | Dacca,                                   | South, fresh with squalls, ..                                   | 23 42 | 90 17 |       |      |      |                                                           |
|                            | Jungpore,                                | North, rain, ..                                                 | 24 28 | 88 13 |       |      |      | { 4 P M Wind veering<br>to NNW                            |
|                            | Malda,                                   | About (NNW) with rain, ..                                       | 25 03 | 88 04 |       |      | 78   | 10 P M, had veered to W.                                  |
|                            | Jumalpoore,                              | About SE, ..                                                    | 24 58 | 89 58 |       |      |      | { At 1h 38m on 22nd a<br>lull, and wind shifting<br>to SW |
|                            | Rungpore Chitlakhai                      | NNE violent gusts and blowing<br>hard, ..                       | 25 52 | 87 00 |       |      |      |                                                           |



I have only been able to find for this Gale a good centre on the 20th September, when, as will be seen, it was blowing in a tolerably well defined circle, the centre falling close to Chittagong, where, as we learn, several native craft perished, whether on that day or not I am not certain, but suppose it most probable. The centre, if it had one on the 21st, was not far from Chilakhal, but it seems to have been a gale which had not sufficient strength to form itself into a regular vortex for more than one day, and was interrupted by other causes producing the irregularities, which will be seen by any person who will take the trouble to examine the table with the chart\*. One of the most probable obstacles may have been the range of the Kasiya hills, which skirt the eastern bank of the Burhampooter

*Some account of a Journey from Kurrachee to Hinglaj, in the Lus territory, descriptive of the intermediate country, and of the port of Soumeanee*      *By Captain HART, 2nd Grenadiers, (Bombay Army)*

[Communicated from the Political Department, Government of India.]

Under the impression that any information regarding this part of the country may prove acceptable, I forward the accompanying remarks made during my late excursion to the celebrated temple of Hinglaj, which I am not aware of any European having before visited. A rough sketch of my route is annexed

On the 24th January I left Kurrachee in company with a party of Hindoo pilgrims, and crossing the Hub river reached Soumeanee in three marches. The route as far as the Hub lies over the high ground between the range of hills in which the hot springs, Pier Munga, are situated and the sea. Owing to a heavy fall of rain a few days previous to my departure, a large body of water was running in the river, but on my return, I found only a small stream, which I

\* The Chart will appear with Part II in the approaching number of the Journal

was told would continue to flow for a short time, and then water always be found in pools. The bottom is covered with loose pebbles, and its width about 100 yards. I saw no signs of cultivation or inhabitants near it, but a few miles higher up, some Noomreea families with their flocks were located. A belt of tamarisk jungle extends for a few hundred yards on each side of the river, four miles beyond it, the road enters a pass in the Pub mountains, called "Guncloba" by Mahomedans, and the "Ungeekhera Bherum Suk," by Hindoos. It is stony, of trifling ascent, and the descent equally gentle to a tract full of ravines, extending from the Mor range of mountains which branch off from the Pub towards Beila and the sand hills on the sea shore. A few years ago this Suk was occupied by a party of Noomreeas who plundered the pilgrims, and eventually stopped all communication, until the Yam of Beila sent troops and dispersed them. Some Mahomedan tombs not far from it were pointed out as having been raised to those who had fallen in battle. To the left of the road, and a hundred yards distant from it, is the Bhowanee well, only three feet in diameter and nearly forty deep. It is said never to be dry, yet travellers alone use it. The face of the country is here sprinkled with patches of milk bush, and low shrubs, which continue to the Boareed Suk, where the road leaves the high ground for the beach. A few miles before reaching it, the bed of the Bohur river is crossed. It appears merely one of the larger ravines, and the route runs a short distance down its bed to avoid an abrupt ascent on its right bank. The Boareed Suk presents a most singular appearance, and is formed by one hill having been detached by some convulsion of nature from the range, which is here about two hundred feet in perpendicular height. The path leads along the edge of a deep ravine, where the rush of the stream has cut a channel as even as if excavated by art, and then winding round the back of the hill, slopes to the shore. The descent is gentle, and laden camels pass without difficulty. The sea at this spot is not far distant, but further on the shore gradually widens, until it leaves an extensive flat between it and the sand hills, in some parts nearly a mile in breadth, covered

with a low jungle of tamarisk, and wild caper bushes. On my return grass had sprung up over the greater part of this tract, and afforded excellent pasture to a few ponies belonging to the pilgrims with us, but I saw very few cattle or goats feeding there. Three miles from the pass is a nulla, in which brackish water is procured by digging, where travellers usually halt, and one mile beyond it a decayed tree marks the "Kharee well," where sufficient is found to supply small parties. This was the second day's journey. On the third, we continued our course along the flat, which is never at present overflowed by the sea, and passed the "Secta Koowas," (a number of kucha wells so called,) which have been sunk at different times, many now filled up by the earth falling in, and but little water in the rest. The sand hills here lose their precipitous appearance, and gradually decrease in size until they sink to the level of the plain. The ruins of a small building named "Peer Putta" by Mahomedans, and "Gopeechund Raja" by Hindoos, lie to the left of the road before it reaches the Vindoor river, which is dry except after heavy rain, when it runs for a few hours only. The bottom is sandy, and its width trifling. A barren plain brought us to a range of sand banks, ascending which we found ourselves in sight of the town of Soumeanee, situated at the head of a bay in an amphitheatre of sand hills, and remarkable only from the absence of all verdure around it. The party halted at a ruined Dhurumsalla, a short distance from the wells which supply the inhabitants with not very sweet water. They are but two in number, only a few feet in diameter, and are lined with logs of wood to prevent the sand choking them. I had previously informed the Dewan of the Yam of Beila of my intention of passing through his country, he came out to meet me, stated that he was directed to obey all my orders, and would, if I wished, accompany me on my journey. His attention was most marked, and it was with difficulty that I declined his request to be allowed to supply food to my party at the Yam's expense, although I particularly explained to him that I was merely a traveller, and not authorized to receive presents from his master, but only desued the protection

always afforded to strangers. He said that the Yam wished by his attention to me to shew the consideration that every British officer would meet with while in his territory, and a Noomreea sepoy was ordered to attend me as long as I remained in the country. In the afternoon the people crowded out of the town to look at me, but I experienced no rudeness or incivility whatever from any one.

The port of Soumeanee has been long known to Europeans Soumeanee, Town and Port, owing to its being on the direct route to Khorasan and Afghanistan. The town is built at the head of a large but shallow bay, in shape not unlike a horse-shoe, into which vessels of heavy burden cannot enter, except at spring tides. The entrance is narrow, and the low sand banks which border the harbour afford little or no protection from the wind. All boats but coasting craft, anchor outside the bar, at a distance of nearly two miles from the town, in the open roadstead, where they are much exposed. Their cargoes are discharged into the smaller dungees and then landed. On inquiring how the horses exported from Khorasan were embarked, I was told that the vessels were brought in at spring tides, and the animals swam off to them. As we halted here a day to lay in a stock of provisions, I had an opportunity of making a few inquiries regarding the state of the district under the Yam's rule, from the Hindoo agents of Kurrachee and other merchants residing there, the result of which I now beg to communicate.

The ancestors of the Yam of Beila are said to be descended from one of the numerous Hindoo Rajas who were converted to the faith on the advent of the followers of the Prophet. At a later period they connected themselves in marriage with the kings of Beeloochistan, better known of late as the "Khans of Kelat," to whom they paid no tribute (although liable to be called on for military service), but on occasions of festivity or visits presented nuzurs as an acknowledgment of their paramount authority. The district over which they rule, extends from the port of Soumeanee northward to Khoydar, and from the Pub mountains beyond the greater range of the Horas. This tract of country is inhabited by the Noomreea tribe who pay allegiance to the Yam.

The only towns comprised within it are Beila, Oothul, Soumeanee, and Lyaree, the former being the usual residence of the chief. Soumeanee is the only port, and the customs on its imports and exports form the principal item of revenue. It is described as having been in former days but a mere village inhabited by fishermen, called as all such places are on this coast, "meanee." Its bay affording more protection to their boats than they could find on the open coast, its population naturally increased, and as trade began to flow through it, the epithet "Sou" was prefixed par excellence. A small mud fort was built on the sea side to check the rapacity of the Gulf pirates, and many Noomreeas from the jungle located themselves there. At present it contains upwards of two hundred houses, Population of Soumeanee built as usual of wattle and mud, and the number of inhabitants is said to amount to a thousand families. Of these the greater proportion are Noomreeas, who earn their subsistence by transporting merchandise to the northward, and fishermen. The Hindoo portion of the population does not exceed three hundred, a few being agents of traders at other ports, and the rest artisans and shopkeepers. The Yam exercises the supreme authority, but as the present incumbent is a child, his power is in the hands of two Dewans, a Mahomedan and a Hindoo. They are however controlled by his mother, who has the reputation of being a woman of sense and discretion. The former regulates the police, and the latter the revenue, the total amount of which is about 45,000 rupees per annum, of this sum from rupees ten to twelve thousand is derived from the cultivation round Beila, Oothul, and Lyaree, where Revenue soowaree, oil seed (shungruf), &c is raised, and the gum of the googhul tree found. The customs collected at the port of Soumeanee and the transit duties of Beila and Oothul are farmed by a Kwaja and a Hindoo for rupees 34,000 per annum, a few years ago the sum paid was rupees 30,000, and before that only 26,000—a pretty convincing proof of the increasing prosperity of the port. Two thousand rupees of this amount are said to be derived from the tax on fish. The contractors pay part of the amount of their agreement in advance, and the balance at the end of the year.

Resident traders are only called on to close their accounts at the annual settlement, but other merchants pay at once. The custom duties are less than those exacted at Kurrachee, and much consideration (as I was told by some Afghan merchants I met there with large investments,) is shewn to all traders by the authorities. On each bale of piece goods rupees 10 are levied; on other articles duty is charged at the rate of rupees 32 to <sup>Duties</sup> merchants, and rupees 38 to ryoths. The principal imports are cloths and metals from Bombay, sent to <sup>Imports and Exports</sup> the northward, and dates from Mukron, and rice from Scinde, for internal consumption, slaves also are brought from Muscat, but seldom unless on private order, on each a tax of rupees 5 is taken. So far have the Hindoos resident here got over some of their prejudices, that the generality of them employ Seedhees as household servants to clean their cooking utensils. The exports consist of wool and googhul from the Beila district, and wheat, ghee, moong, asafetida, and horses from Khorasan. The former article is brought in large quantities from the hills near Shah Bilawul and beyond Beila, its quality is finer than that shipped at Kurrachee, and the cost here averages from 14 to 16 rupees a maund. The oil plant (Shura or Shungruf) is raised in large quantities, and both its seed and oil are sent to Muscat, Gavaddel, Kurrachee, and the mouths of the Indus. In Soumeanee alone I saw no less than twenty mills at work. The coins in circulation in the towns are German crowns or rials, ———\* and Soumeanee pice, those of Kurrachee not being current in the neighbourhood. There <sup>Tonnage of the Port</sup> are only six vessels of any size belonging to the port, five owned by a Hindoo, and one by a Mahomedan. The fishing and coasting boats are about twenty in number. When walking round the town I examined the remains of the fort. It appears to have been of very small extent. The remains of two <sup>The Fort</sup> bastions and a curtain on the sea side are now alone discernible, and they are almost level with the ground. The bank on which it stands has been partially washed away, but the Dewan explained to me as the cause of its never having been repaired, that since the destruction of the pirates by the British, it was

Shops on longer of use The number of shops do not exceed fifteen, in which grain and dates are sold. The weavers (of whom there are not many) fabricate a few silks and coarse cotton cloths, Manufactures which find a sale here; a common kind of carpet called a "furrash" is also made from goat and camel hair. Indigo is imported in small quantities, and is used by the dyers (there are only three) in colouring the clothes of the male portion of the population There are four mosques, and Mosques and temples six dhurumsallas and temples in the town and neighbourhood. I was informed by the Afghan merchants that at present the hire of a camel to Kelat was as high as twenty-five rupees, owing to the great demand for them by our troops Goods to the amount of rupees six hundred, the property of one of them, had a few days before been stolen from the "Peer Kee jugah" outside the town, where they usually halt On representing his case to the Dewan, he told me the thieves had been traced, and that no exertions should be wanting on his part to restore it, and what the plunderers could not pay in *kind*, they should *in person*. In the customs farmed by the Payments made by Pilgrims visiting Hinglaj contractors the sum of rupees 2/2 taken from each pilgrim, and some mendicants, who visit the temple at Hinglaj should be noticed Of this six annas belongs to the Yam, part of the balance is divided by the town authorities, and the remainder goes to the contractors For it, protection is supposed to be afforded them while in his territory, and as a proof of it, one of the leaders of a party we met, mentioned his having lost a "kottia," or drinking vessel, some years before at the Aghor river, and on his preferring a complaint, that it was searched for, and found in the hut of a Noomreea, who was forced to return it, and had a valuable camel taken from him as a punishment. I met several of the pilgrims who had lost articles of trifling value, and one, who was head of his party, a few marches beyond Soumeanee was robbed of his clothes and grain, but they felt confident if they saw the Dewan on their way back, that he would oblige the contractors to pay their value.

Fresh camels having been hired in the place of those brought from Kurrachee, which do not thrive on the forage

found here, and are less strong and healthy in appearance than those bred on the hills, we set out at midday on the 28th, and as the direct route was unsafe for the camels, from the ground having been so lately saturated with rain, we wound round the town, and reached the sea beach, along which we marched for some miles, until nearing the creek at the northern extremity of the bay into which the Pooralee river empties itself, we turned north, and keeping close to the edge of the sand hills which border the mangrove swamp called "Gooroo-Cherla-Kar-un" reached a pool of fresh water, where we halted.

Churoo, 9 miles

This spot is named Churoo, and is merely a place of encampment. A few herds of camels were feeding in the cypress jungle, which covers the inlets from the swamp. Their attendants were the only people we saw on the road. A short distance before arriving at our ground, we passed the tomb of "Shaik Ali, or Swamee," built on one of the low sandy ridges which here extend inland as far as the eye can reach, covered with stunted milk bushes and tufts of coarse grass. To its right runs the road to Lyaree. The following morning we crossed the "Thura," a flat which extends for many miles between Lyaree and Shaik Karaj. Brushwood abounds on it, and both cattle and goats find pasture on the grass which grows there; the few I saw however did not appear in good condition. An open plain on our right, sprinkled with cypress bushes, was pointed out as reaching to near Lyaree, but I could not distinguish any signs of cultivation. Continuing a westerly

The Pooralee River

course, we came to the Pooralee river, an insignificant stream with a muddy bottom. It rises in hills north of Beila, and is said always to have water in its bed, but the cultivators of Lyaree raise embankments across it for the purpose of irrigating their fields, so that unless after heavy rain it cannot be called a running stream below that town. Beyond it a gradual rise brought us to another range of sand hills, in the midst of which we encamped near a small well of brackish water. This is generally the first stage from Soumeanec, but the "Truppa" being slippery for camels, where it is usually crossed, we were obliged to make a circuit, which doubled Dambo, 9 miles the distance, to Dambo. This likewise is only



a halting place, as were all the stations on the route to Hinglay, without the sign of a habitation or a human being near them. The few Noomreeas who are scattered over the face of the country keep their flocks at a distance from the road, but whenever they see a cafila, they come with their families to beg for food. It has become an acknowledged custom for all travellers to give it, even the mendicants themselves spare a portion of their coarse bread for the purpose. Money (save a few Soumeanee pice, to pay for milk when it can be had) is almost useless, for nothing is to be purchased on this barren waste. A mile beyond Dambo, before leaving the sand hills, a small grove of cypress trees is passed, noticed as being of greater size than those met with elsewhere. On descending from the ridge, the road crosses the heads of a number of inlets running into an extensive backwater from the sea, which here is not visible, as the sand banks along the shore are rather abrupt. Ascending a gentle rise we come on a plain covered with a small bush called Lavee or Lauoo, on which the camels fed with great avidity. Of the plant there are two kinds, the male called Lauoo, and the female Lavee. They are much the same in appearance, excepting the leaf of the latter is shorter and thicker than the former, potash is produced by burning the male plant, which is taken to Kurrachee and Soumeanee, and sells at from four to five cassess (about 100 pounds) per rupee. This tract is called "Chura," more particularly that portion of it where low cypress bushes flourish, and pools of clear water with a few wells are found. The open plain extends to the foot of the mountains, and inland to a great distance. Twelve miles from Dambo we found the wells at Kattewara, 12 miles. Kattewara, the encamping ground, choked, nor did we discover water until reaching the base of the lesser range of the Haras, when the pool of a cataract about half a mile up a rugged ravine was pointed out to us by a Beroon we casually met on his way to Soumeanee to dispose of camels. This range of mountains, although their height is comparatively trifling, present a most singularly wild appearance, from their rising at once from the plain at an angle of about forty-five degrees on their eastern side, with a still

greater slope to the westward, and being totally bare of all verdure. They are composed of sandstone, and their summits are broken into rugged peaks of the most fantastic shapes. They appear to rise in regular layers, their height gradually increasing as they recede from the plain. Our route the next morning lay along their base, and after passing the beds of many dry nullas we came to a pass near their south-eastern extremity, where they sink into the plain about four miles from the sea. This lake is termed "Gooroo Bherund," and is formed by a large ravine, the course of which we followed for a short distance, and then turning to the left reached the top of the heights, and came in sight of the greater range of the Haras, running almost at right angles to the lesser.

The Phor river, 11 miles Between the two ranges the Phor river flows through a plain similar to that we had passed. Its banks are fringed as usual with a belt of tamarisk jungle. Before reaching it a number of Mahomedan tombs are remarked, and near them, under a clump of trees, some Noomreeas were engaged in raising a crop of jowaree, the first attempt at cultivation I had seen since leaving Kurrachee. Water is occasionally found in pools in the river, and higher up it can always be procured by digging. Six miles beyond it we came to the Tilookpooree wells, at present covered with an extensive marsh of fresh water, formed by the late rain.

The Chunder kooops, 6 miles One koss from them, in a westerly direction, three hills of extremely light colored earth rise abruptly from the plain. That in the centre is about four hundred feet in height, of a conical form, with the apex flattened and discolored, its southern and western faces rather precipitous, but with a more gradual slope on the others. It is connected with a smaller one of the same form, but of not more than half its size, by a sort of causeway, some fifty paces in length. The third bears the appearance of the cone having been depressed and broken, and covers a greater extent of ground than the others. All three towards their bases are indented by numerous cavities which reach far into their interior; their sides are streaked with channels as if from water having flowed down them. On ascending to the summit of the highest one, I observed a basin of liquid mud, about one hundred paces in circumference, occu-

pying its entire crest Near the southern edge, at intervals of a quarter of a minute, a few small bubbles appeared on the surface, that part of the mass was then gently heaved up, and a jet of liquid mud, about a foot in diameter, rose to that height, accompanied by a slight bubbling noise Another heave followed, and three jets rose, but the third time only two. They were not of magnitude sufficient to disturb the whole surface, the mud of which at a distance from the irruption was of a thicker consistency than where it took place. The pathway round the edge was slippery and unsafe, from its being quite saturated with moisture, which gives the top a dark colored appearance; on the southern side, a channel, a few feet in breadth, was quite wet from the eruption having recently flowed down it I was told, that every *Monday* the jets rose with greater rapidity than at other times, and then only did any of the mass ooze out of the basin The entire coating of the hill appears to be composed of this mud baked by the sun to hardness No stones are to be found on it, but near the base I picked up a few pieces of quartz Crossing the ridge which connects this hill with the least of the three, I climbed up its rather steep side In height or compass it is not half the magnitude of its neighbour, and its basin, which is full of the same liquid mud cannot be more than five and twenty paces in diameter, the edge is so narrow and broken that I did not attempt to walk round it. One jet only rose on its surface, but not more than an inch in height or breadth, but a very small portion of the mass was disturbed by its action, and although the plain below bore evident marks of having been once deluged to a short distance with its stream, no eruption had apparently taken place for some years. At times the surface of this pool sinks almost to the level of the plain, at others it rises so as to overflow its basin, but generally it remains in the quiescent state in which I saw it; two<sup>o</sup> years previous it was many feet below the edge of the crest. On my way to the third hill I passed over a flat of a few hundred yards which divides it from the other two. The sides are much more furrowed with fissures than theirs are, although their depth is less, and its crest is more extended and irregular. The

ascent is very gentle, and its height about two hundred feet. On reaching the summit, a large circular cavity, some fifty yards in diameter, is seen, in which are two distinct pools of unequal size, divided by a mound of earth, one containing the liquid mud and the other clear water. The surface of the former was slightly agitated by about a dozen small jets, which bubbled up at intervals, but in the latter, one only was occasionally discernible. A space of a few yards extended on three sides from the outer crust to the edge of the cavity, which was about fifty feet above the level of the pools, their sides are scarped and uneven. On descending the northern face, I remarked a small stream of clear water flowing from one of the fissures into the plain, which had evidently only been running a few hours, the mud and water of all the pools are salt. A fourth hill, situated close to the great range of Haras, and distant from the rest upwards of six miles, was pointed out as having a similar cavity to this one. Its color is the same, and although the surface is more rounded, its summit appears broken, I regretted not having an opportunity of visiting it. The name given to these singular productions of nature is the "Koops, or basin of Raj Ram Chunder," by which appellation they are known to all the tribes. They are said to be altogether eighteen in number, seven in this neighbourhood, and eleven between Kedje and Ginaddel in Mukran. Four were pointed out to me, and I was told the other three were hid among the mountains. Some persons with my party had seen one of those in Mukran, and had heard from the Beerooers who shewed them the road to it, that many others were spread over the country, he described it as throwing up jets similar to the large hill here. By the Hindoos they are looked upon as the habitation of a deity, but the Mahomedans state that they are affected by the tide (the sea is not more than a mile distant from the large one,) but this I had reason to doubt, as of the many persons I questioned who had visited them at all times, not one remembered to have seen the pools quiescent, although several had been on the large hill when the mud was trickling over the side of the basin. To endeavour to ascertain this fact I placed several dry clods of earth in the bed of the channel

on a Saturday, as I expected to return by the same route the following week. A range of low hills of irregular form lie to the westward of, and almost close to, the Chunder Koops. I had not time to examine them, but from their appearance I judged they contained sulphur, and on questioning some of those with me, and who crossed them, they said the taste of the earth was like that near the hot springs at Sehwan, where it is known to abound. A Noomreea who was present, mentioned that about six koss off there was another hill called by the name of the "sulphur mountain."

Leaving the Koops on our left, we continued our route towards the greater Haras, increasing our distance from the sea as we advanced. An isolated cluster of hills on the shore, called the "Sath Durwauza," and a rock near them, were pointed out as spots much revered by the Hindoos, a range of sand hills soon hid them from our sight, and we crossed the beds of many nullas, the banks of which were thickly lined with tamarisk and baubul trees. This tract is called the "Chota Singhal," and a well in one of its water courses is generally the halting place for pilgrims. We found it dry, and pushed on three miles further to the "Burra Singhal," where in a nulla, at no great distance from the mountains, we came to another well with sufficient water in it for us all. A Beerooe musician with his family here joined us for the sake of the food he was certain of obtaining as long as he remained in our company. A camel and pony, the one led by his son, carrying his wife and two children with their baggage, and the latter ridden by himself with his sitar, was all they possessed. He told me he had left his village in Mukran to visit Beila, in the hope of collecting grain by his skill in music, but not meeting any one who appreciated his merits, he was now on his way home. He earned a precarious subsistence by travelling to the camps of the different chiefs, and reciting the wars of the Yokeas and Beloochees, they sometimes rewarded him with gifts of food and clothes, &c. The animals he now had, had been thus presented to him. He remained with us some days, and on his leaving he begged the money I gave him might be exchanged for tobacco or grain. From the

Burra and Chota Singhal,  
8 and 11 miles

Singhul the road runs nearly parallel to the mountains, which here present the same features as the lesser Haras, decreasing like them in height as they near the sea, but an acclivitous and bold range towering far above them was pointed out as that in which the far famed temple of Hinglaj was situated. We passed this day the first encampment of Beerooees I had seen ; about twenty families were pitched on the banks of a ravine, where wood and water were found in sufficient quantities to supply their wants, A cloth of camel or goat hair stretched over a pole formed their dwelling, and for their food, the milk of their flocks, prepared in various ways, and a very small quantity of the coarsest grain sufficed. The men wore drawers, with a loose cloth thrown over the shoulders, the dress of the women was merely a long garment reaching from the neck to the ancles. We now skirted the base of the mountains, and passing between them and a low broken range running at right angles, came in sight of the pass leading to the Aghor river, an easy ascent of a few hundred yards, over sandy rock, led to the summit, and a gentle slope of half a mile brought us to the bank of the

The Aghor or Hingool stream      The view as we turned up its course  
 river, 8 miles      was magnificent      The river here flows through  
 a break in the mountains, about two hundred yards in width. The faces of the rocks towards the stream are broken and craggy. That on the left bank is higher and more scarped than its opposite neighbour. Beyond them in the distance is seen a range of light colored sand hills, to all appearance nothing but a mass of conical-shaped peaks, and towering far above them are the blue mountains of Hinglaj, precipitous and wild. We encamped above the tamarisk jungle on the high ground between the river's bed and the hills. The width of the stream at this spot is about sixty yards, its bed muddy, and sprinkled with low bushes. The water is not considered very wholesome, as a great quantity of sand is mixed up with it. It reaches the sea about six miles from the hills, and I saw from an eminence many fishing boats from Kurrachee, Soumeanee, and Oormura, anchored at its mouth. A short distance below the pass, on the left bank of the stream, are the remains of an ancient village, the name of which has been long since

forgotten The site of the houses can hardly be traced, but I found many pieces of glazed pottery and glass among their ruins A number of Mahomedan tombs are scattered over the high ground in the vicinity, and in the bed of the river is a bluff rock on which are the ruins of a small fort called Rana-Ka-Kot Rana-Ka-Kot It is said to have been built when the Hindoos held the sovereignty of the country, to protect the pilgrims going to Hinglaj from the pirates, who used to run up the river in small boats to plunder them. It covers the whole face of the rock, and consists of two towers joined by an embankment, with a well in the centre, the foundation now alone remains After heavy rain, it is said that pieces of silver are occasionally found in the site of the village, but I was not able to obtain any, and imagine that although some may once have been seen there, yet were it supposed that the most minute search would be rewarded by even a copper coin, the abject poverty of the people would induce them to dig up the whole surface in searching for it The hills here are composed of sandstone, layers of shells, and conglomerate

I made many inquiries regarding the numerous Mahomedan Tombs Mahomedan Tombs medan tombs which are scattered over the face of the country, near many of which not the slightest trace of a habitation remains, and the situation of some are so far from streams or wells, that the cause of their having been built in such barren spots cannot now be accounted for

I imagine that when the Mahomedans had established themselves in Scinde, their detachments were stationed in all parts to keep the inhabitants in check, and the spirit of conversion being then all powerful, they buried their dead with much ceremony, and erected stone tombs over them to impress the idolaters with a high sense of the excellence of that faith, which decreed such honours to the departed On the decline of the Mogul empire, when the troops were required for the defence of the interior, these detachments were withdrawn, the mud huts of the camps soon fell to decay, the population which had been drawn together from the jungle, and derived a subsistence by raising grain to supply them, again spread over the country, and resumed their pastoral habits, when the demand for the produce of their

cultivation ceased ; the embankments raised for irrigation were swept away on the flooding of the streams, the log lined wells soon fell in, and these monuments of stone alone remained to mark where the camps had existed. The very name of the stations, most probably that of the first chief who pitched his standard on the spot, was soon forgotten by the wandering tribes who fed their flocks in the vicinity, when the memorials of his stay had crumbled into dust

The Aghor river is the boundary between the territory of the Yam of Beila and that of the Khan of Kelat, the chief of the Beerooees. They and the Noomreeas do not intermarry, and although at present at peace with each other, have no hesitation in robbing and plundering whenever opportunity offers. The Beerooees are usually the aggressors, being better armed, and their places of residence in the mountainous countries of Mukran and Beeloochistan little known. The very day I reached the Aghor a party of them, under a person named Dadruheem Khan, on their way to Beila, took from the hut of two Noomreeas every article they could lay hands on, and levied a contribution of gram from some Hindoo pilgrims encamped there. They likewise stopped some of the people with whom I was travelling, who were in advance of the baggage, but on learning that a British officer accompanied them, they instantly let them go. At the Beerooe encampment also they demanded some sheep as a present, but a Noomreea I had left there to purchase milk, threatened them with my anger if they dared to seize even one. Such is the effect which has been produced on the minds of these lawless men by the gallant capture of Kelat, that they proceeded on their way without enforcing their demand. They were more numerous, and better appointed than the armed men with my party, and had they chosen, might have robbed us without much difficulty, but the very name of a European appeared to frighten them. A few months ago I should have been treated with every contumely, but now all were anxious to pay me attention. I felt convinced that the only danger attending my excursion was what I might incur from the vengeance of individuals who had lost relations or friends at the storm of the fort, but even their irritated



feelings will be allayed by time. In a country so divided into petty tribes as Beeloochistan, where the authority of the chief, although acknowledged, is but little heeded, and where no man's life or property is safe, further than he can himself protect it, for a traveller to straggle from his party is of course unsafe, as the wretched state of poverty and starvation in which the greater portion of the population exist would induce them to make a dash at him for the sake of his clothes. I was warned of this at Soumeanee, and could never leave our camp without one of the attendants following me at a distance to watch over my security. While halted at the river, upwards of sixty Beerooe and Noomreea families collected round us to be fed; they came from all parts, and I had therefore an opportunity of inquiring about their mode of life. The milk of their camels, goats, and ewes, the dried berry called beera, wild herbs, and a very small quantity of the coarsest jowaree are what they subsist on, meat they seldom touch, as all the male animals are disposed of for clothes or grain, and the females kept for their produce. Dates are considered a luxury, so much so, that when at Soumeanee, I was told of a Noomreea having asked a banian in whose shop he saw a pile of bags of them, whether he took any rest at night. On the Hindoo replying, of course he did; the Noomreea expressed his surprise, and said, were he there, he should be eating the dates day and night. Whenever I offered money, food was always requested in lieu of it. The complexions of the females are more fair than could have been expected from their exposed mode of life, and the number of children with them was, as is usual among a poor population, very great. The Beerooes all wear the low conical cap, which affords even less protection to the head than that of Scinde. All were armed, mostly with a matchlock and long knife some had swords. Neither they nor the Noomreeas pay any regular tribute, but on occasions of festivity, the chiefs raise contributions in kind from the heads of families. All are liable to be called on for military service, during which time they receive food and trifling pay. In the Yam's territory, whenever cultivation is carried on, "one third" of the produce goes to the chief, and the remainder is left to

the peasant. The vicinity of roads is generally avoided, to escape molestation from travellers, and their camps are moved from place to place as water or pasturage fail them. The nearest village to Hinglaj is Oormura, situated on the coast, at a distance of two days march, and said to contain two hundred inhabitants, many of whom are fishermen. A few Hindoo shop-keepers reside there. The coins current are the German crown, the Mahmoodie rupee, and the paolee. It is described as having a good bay, but my time did not admit of visiting it.

On ascending the left bank of the river, after passing The Aghor river, 8 miles between the peaks in the mountains, which seem as if they had been severed by some convulsion of nature, a full view is obtained of the sand hills. They appear to consist of one irregular range, cut in two by the river extending southwards to near the sea, and to the north, far into the mountains. They are from three to four hundred feet in height, covered from base to summit with numberless small conical-shaped, ribbed peaks, like that of the Chundur Kooops, and their surface appears to have been baked to hardness by the sun. Towards the plain a few are coated with a crust of dark brown colored sandstone, with which at one time the whole range seems to have been covered. A winding path, with several ascents and descents, steep, though short, leads through them. I picked up many pieces of talc, (or Govid nusree and Cherotee as it was called by my companions) in the water courses near them. On the north-eastern side is a plain of a mile in length and half that width, much cut up by ravines. Through this the river flows over a bed of pebbles, its banks fringed with tamarisk and baubul trees; on its right bank rises the Hingool mountain, conspicuous in the range by its great height and scarped sides. The name given to the stream above the peak in the Hara mountains is the Hingool, and from them to the sea it is called the Aghor. It is always a running stream, is said to have a very long course, and rises on the melting of the snow to the northward, or as it was described to me, without rain falling. After crossing its bed, where the water was about knee deep, the path enters a deep ravine, which leads to a

Assar Poora, 7 miles narrow valley, and after winding among the hills for about two miles, reaches a running stream, almost hid by low tamarisk bushes, on the banks of which is the usual halting place. Half a mile from the valley, in a narrow Hinglaj,  $\frac{1}{2}$  mile gorge, the mountains on each side of which rise perpendicularly to nearly a thousand feet, is situated the temple of Hinglaj. It is a low mud edifice, built at one end of a natural cave of small dimensions, and only contains a tomb-shaped stone, which is called the goddess Mata, or Mahamayee. At the head of the gorge, a steep and difficult ascent up the course of a water-fall leads to the top of the mountains, and after winding over their summits for some five or six miles, the pathway descends by another water course to the valley, where we encamped. An account of the different holy places visited, and the ceremonies performed on the journey, are fully detailed in my description of the pilgrimage to Hinglaj.

Soon after reaching our encampment, another party of armed Beerooees arrived on their way to Beila, to learn the state of affairs. They requested me to give them tobacco and medicine, said they lived from hand to mouth, and now that their chief was killed (he had fallen at Kelat) were worse off than before. Kelat, the capital, had been always looked on in this part of the world as a maiden city, until the descendant of a line of kings fell, as became him, on his throne, before the all-conquering arm of the British soldiery.

This party was under Chota Beerooee, and was, I imagine, only on the look out for plunder, as a day or two after our return to the banks of the Aghor river they again passed us on their way back, without stopping as usual for food; and that same evening one of our camels was missing, stolen no doubt by them. This was the limit of my excursion. The time fixed for rejoining my regiment having nearly expired, I was not able to extend my journey, as I now felt anxious to do, by proceeding along the coast as far as Gwaddel, and then turning north through Kedge Pungoor and Noskky, visiting Kelat, and returning to Kurrachee via Khozdar and Beila.

On our way back, nine days after first seeing them, I again visited the Chunder Koops. The appearance of the

one which was fallen in, was as sand in a muddy pool, but that of water, instead of being clear as before was quite discolored; the stream also had ceased flowing for some time, as the plain bore no marks of moisture. On reaching the summit of the larger one, it was very evident that an eruption had taken place the day before (Monday), for the channel on the western side was quite filled with slime, which had oozed down the side of the hill, and ran some thirty yards into the plain below. The dry clods I had placed when before here, were covered, and it was not safe to cross where the mud had found an issue, whereas my whole party had, when with me, walked round the edge of the basin. The jets rose as usual. So tenacious is the mud of this one, that even cocoanuts which the Hindoos throw on it do not sink, but in the others it is more liquid. No alteration had taken place in the appearance of the small Koop.

We now followed our former route, halting at the Phor river near a muddy pool, and at a brackish well in the Churra. Our next stage was over the plain beyond Dambo, and across the Pooralee river (now quite dry), to a tank near Shaik Boolun's tomb. After passing it we crossed some low sandy ridges, and wound under a range of sand hills, on which is a well, close to a few tamarisk trees. We then came to a salt flat called the Truppa, extending from the Gooroo-Chela-Karun to the Thura, from which it is distinguished by being totally bare of all shrubs. The tide does not affect it, but rain brings out a crust of salt. We rejoined our former route at the groves of the Gooroo and Chela, and then entering the sand hills which encompass Soumeanee, descended to an oblong amphitheatre surrounded by them, of about half a mile in width and four in length, covered with the lavoo bush, and dotted here and there with pools of brackish water. This tract is called the "Dotur Puk," and it was to avoid it that we kept to the beach road when on our way to Dambo. I had been told that the Yam and his Dewan intended visiting me on my return and offering some presents, but I fortunately reached Soumeanee when they were at Lyaree, and after addressing letters to them both expressing my thanks for the attention

which had been paid me, and the safety with which I had traversed the country, I rode in at once to Kurrachee. Most polite answers have since reached me, regretting that my unexpected departure prevented their having the pleasure of seeing me.

In the hills between Lyaree and Beila “copper” is found in large quantities. A Hindoo now in Kurrachee loaded twenty camels with ore, on his return from Hinglay, and obtained as many maunds of good metal from it. The whole country is indeed rich in mineral productions, and well worthy the attention of an experienced geologist.

1st March, 1840

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NOTE.—The singular and remote place of pilgrimage, visited by Capt Hart, as described in the above interesting paper, is one of the fifty-one *Pitas*, or places celebrated as the spots on which the dismembered limbs of *Sati* or *Doorga* were scattered. An intelligent native friend (Race Sectanath Bhose Bahadoor) informs me that the word *Hinglay* is not met with in any Sanscrit Dictionary of good authority, and it would appear to be a corruption of the word *Hingulà*, the name of the spot on which the crown of the head (*Bramarandra*) of *Doorga* was cast. My informant has not been able to find any mention of the geographical position of the place so named in the works to which he has referred, but there can be little doubt as to the identity of the spot. He has furnished me with a table of the various *Pitas*, with the names under which *Doorga* and *Shiva* are worshipped at each, one of these spots being *Kalpita*, or Kali Ghat near Calcutta. The *Churamun Tantra* is, I am told, the authority to be consulted on the subject of this particular fable.



*Fourth Report on the Tenasserim Provinces considered as a resort for Europeans* —By JOHN WILLIAM HELFER, M.D

England has nearly acquired that full amount of improvement and civilization which its situation, as respects foreign countries in Europe, which its climate, its soil, will ever allow it to acquire

Scotland and Ireland are still capable of great improvement, however, in the former climate renders success precarious, in the other, moral reasons obstruct amelioration

England would scarcely advance, when confined to England, nay, it would be obliged to retrograde That which renders England powerful, and continues to increase its riches and prosperity, is its universal commerce, and its transatlantic colonization

England, of all countries, knew at all times the best to appreciate the value of colonies All its colonies advance rapidly, and new ones continue to be established The East Indies, finally, have also been opened to the mass of the British nation, and these immense territories afford a field of such importance, that its vast consequences cannot yet be appreciated at the present day

Adventurers are always attracted by the hopes of sudden gain, and the fables of India's immense riches, are yet vivid in the imagination of the multitude As the Spaniards flocking to America in search of the Eldorado, when disappointed turned agriculturists, so when the East Indian adventurers find out the errors of their hopes and fancies, they will become sober colonists, for prospects there are certainly open to them, not to become suddenly rich, but gradually wealthy

It has frequently been stated that Europeans are not fit to become tropical colonists If this were the case, no colony would have been established in the West Indies, much less would any have become flourishing. Certainly they are not able to bear the climate as day labourers, at least not the greater part, however they can become landed proprietors, superintending their farms, and carrying on cultivation by the labour of other people

There is much difference between tropical colonies and colonies in the temperate zone, both sets have their particular advantages, and disadvantages. Tropical colonies can only be established by men who are wealthy, or who possess moderate capital to begin with. They employ either the natives of the country in which they settle, or they import foreign labourers \* \* \*

As the stream of European enterprise will turn towards India, it is necessary to direct it into the most safe channel, and the following paragraphs are written for the purpose of pointing out the different very great advantages which the provinces of Tenasserim possess, containing all that is requisite to transform them into an European tropical colony able to prosper in an eminent degree.

In every colony the new comer finds the country either a waste or occupied, and if occupied, it is occupied either by temporary tenants, or a fixed population.

Temporary tenants do not make use of the ground permanently, they are tribes of hunters, or graziers, or people who resort to certain places for the sake of a particular spontaneous production fit for their own use, or for exchange.

A fixed population makes use of the ground as the source of their livelihood.

The Tenasserim Provinces contain all these divisions combined. A great, and the greatest portion is a waste, part of it is used on account of its teak forests, or sapan-wood jungles, or wood-oil trees; other parts are resorted to exclusively on account of a productive fishery, others, on account of the rocks producing edible birds' nests, the smallest part of it is occupied by permanent dwellers, engaged in cultivating the ground.

I The first great advantage which the Tenasserim Provinces offers, *is the abundance of lands of every description.*

An obstacle which has been found in most of such uncivilized countries is, that the inhabitants come very soon into collision with the new comers.

This can happen only in countries like America, where the population subsisted upon the produce of the chase.

In Tenasserim this would not be the case, for no part

of the population is employed exclusively with hunting, except a few Siamese, who pursue the elephant and rhinoceros, for the sake of the tusk, and rhinoceros' horns. The new comers therefore could only come in collision with the permanent dweller, that is, the planter.

Four-fifths of the native planters confine themselves to the production of rice, which is their chief alimentary subsistence.

The new comer would scarcely begin with this mode of cultivation, but would turn his attention to other articles which are more valuable, and procure his rice from the natives.

The existence of this population of husbandmen is an advantage to emigrants, because they furnish them with food; and it is an advantage to the natives, who find an increased consumption in the emigrant. Another obstacle occurring in countries already occupied, is the spirit of envy and enmity with which the native population is inspired towards the new comers. This spirit of enmity is to be derived either from the principle of self-preservation, or it is founded on religious prejudice, and national aversion.

If we judge from experience and inference, nothing is to be apprehended from the natives of these provinces in this respect.

The Chinese wherever they settled in the provinces, though they over-reached the Burmese in every respect, in a short time were always welcomed and encouraged by them.

They have no more dislike or aversion to European settlers than to the Chinese. Their religion is eminently tolerant, and as for national prejudices, they are far from disliking the Europeans, whom they consider rather to be a variety of the human species of a higher order.

II The first aim of a colony is to give sustenance to an increasing number of people, as culture and produce increase, a surplus is gained, and the next step will be the endeavour to exchange the surplus for other commodities.

The Tenasserim Provinces are eminently well situated for commerce, their extent of sea-coast amounts to 600 miles; the formation of the country is that of a narrow strip of inland, from which descend numerous navigable rivers, keeping it connected



with the sea coast, and presenting *the greatest facilities for communication*

III The next advantage which these countries possess over all parts of India Proper—an advantage of the greatest importance to European settlers—is *the great salubrity of the climate*, which is so remarkable, that the provinces are considered by persons who have had opportunities of comparing the different climates of America, to belong to the most healthy for the European constitution of all known tropical countries To be convinced of this truth, it is only necessary to compare the bills of mortality kept by the medical gentlemen of the European British corps, stationed at Maulmain and its dependencies, which prove that the rate of mortality scarcely ever exceeds, and is sometimes less than it would be under similar circumstances in Europe

To account satisfactorily for this phenomenon is very difficult, when we see the countries almost bordering upon the provinces are counted amongst the most fatal of India, Arracan in particular, where the general appearance and form of the country, as well as the nature of its productions, are said to be similar to Tenasserim

No other reason can be found, than that the country is either part of a narrow peninsula, or immediately adjacent, and that the extensive seas on both sides produce a constant, though not always perceptible current of air, and consequent ventilation, by which the rising obnoxious vapours of fermenting vegetable matter, and other elements of malaria, are either destroyed or carried away

It is certain that the Arracan fevers are scarcely known, that liver complaints are of rarer occurrence, and pneumonic diseases scarcely known It may be even asserted that Europeans of temperate habits, chiefly those not addicted to strong liquors, enjoy a greater health than natives, especially native children suffering from the small pox, which occurs epidemically at intervals, and carries away at times considerable numbers, much more, because all the endeavours of medical gentlemen to introduce vaccination have hitherto proved fruitless, some isolated cases excepted

Preservation of health, besides, does not require here those particular precautions so necessary in India

Bad effects from exposure are of very rare occurrence, as sporting gentlemen have ample leisure to experience, and this would certainly be of immense advantage to a planter, whose chief occupations are in the fields

The coolness of the nights almost throughout the year, much contributes to restore vigour and health to a constitution which by constant perspiration during the heat of the day in the dry season, is partially exhausted

The dangers from wild animals, snakes, and other venomous reptiles, are generally much exaggerated in Europe, if not altogether fabulous. In Tenasserim very little is to be apprehended from these animals

There are tigers, and pretty numerous too, in the country, but they are of quite a different nature from those in Bengal, and probably more afraid of men than men of them. Accidents very seldom happen to natives, who penetrate daily into untrodden jungles, sometimes quite alone. No other quadruped else is to be feared, a planter may reside his whole life-time in the country without even having an opportunity of seeing a wild elephant or a rhinoceros. Dangerous snakes are very rarely met with, and I dare say less fatal accidents happen here than in the south of Europe

IV *The fertility* of a country is of a double nature—essential and accidental. The essential fertility is dependent upon the nature of the soil, the accidental, on the quantity of fertilizing matter found upon the surface, constituting a mould of humus. To determine properly the fertility of the Tenasserim provinces, we must retrace our steps to geological principles, and examine the different formations. A great portion of the surface in the interior is composed of primitive rocks, chiefly granite, great parts of the mountains, running parallel from north to south through the peninsula are granite or gneiss. The ridges are divided by valleys of an inconsiderable depth. The mountains themselves are scarcely ever very abruptly precipitous, generally rounded near the tops, without being lacerated. Almost every where, at least to some inches in depth, the sur-

face is decomposed, and throughout covered with lofty vegetation, a bare rock is one of the greatest rarities on the main land. The felspar decomposes exceedingly quick in tropical humid countries, and is found, contrary to the theory of celebrated chemists, one of the most fertilizing substances within the tropics; the reason is probably that the caustic of potassa or soda, which forms part of the elements of felspar, is neutralized by the abundance of humic acid produced by the immense quantity of decaying vegetable matter.

Hence we see that the valleys between the granitic ridges of the country into which all the decomposed particles are uninterruptedly swept from the sides of the mountains, together with the numerous decayed vegetable substances, belong to the richest soils of this country. Just this part of the country, chiefly inland, is uninhabited, or only employed by isolated Karcans. Not an inconsiderable portion of the surface of the provinces belong to the transition formations. They are much more abundant in the northern and middle, than in the southern parts. These are to be divided into the schistous and calcareous surfaces.

A great part of the country to the south of Maulman and to the south of Ye, towards Tavoy, present argillaceous transition schist. This is that part of the country which is the most sterile of all, a more stunted vegetation is immediately observed, and great part of this tract instead of presenting lofty forests, is covered with bamboo. The chief reason of this sterility may be accounted for, by the deficient and but slow decomposition of the schists, and by the absence of sandy particles, and by the great absorption of water and moisture.

The province of Amherst possesses remarkable isolated rocks, or ridges of some extent, composed of mountain limestone.

The plains at the base of these abrupt mountains are remarkably fertile.

The mountains themselves, however, rising sometimes perpendicularly, full of chasms, without any level ground, will be found in every respect unavailable for cultivation.

Secondary formations, and amongst those the secondary sandstones (*Gres bigarre*) with puddingstones, cover the surface

They are mostly to be found in the southern parts of province Amherst and in Ye province

These tracts of land will be found but indifferently fertile, and the reason is their aridity, the water being absorbed with avidity by the porous puddingstones, meanwhile the argillaceous parts which enter into the composition form a hard crust, impenetrable to water. Though numerous, these districts never cover a great surface<sup>1</sup>

Part of the plains of the provinces belong to the tertiary formation, such are the higher parts of Amherst and Ye province, the plains of Tavoy and Kallee-oung, the plains between Tavoy and Polon, such the valley of Taun-biauk and the elevated land of Meta-mio, such the plain country on the Tenasserim river above the site of the old town, which is an argillaceous marly deposit of great extent. All these enumerated places are fertile, scarcely any are exclusively sandy, none, as much as I am aware of, gypsous

To the postdiluvian formations belong the deltas of the rivers, which are, when above the influence of the salt water, highly fertile, if however so low as to be exposed to the influence of the salt water, entirely unproductive. To the first belong the low lands on the confluence of the Salween, the Gawn, and the Attaran rivers, the small delta of the Ye river, and others of minor note between Tavoy and Mergui, to the latter belong all the mangrove districts, which are entirely unfit for cultivation. The great source of fertility in the country, independent of the fertilizing elements of the ground, is the quantity of the humus, or decayed vegetable matter, which has accumulated through tens of centuries. It is only necessary to represent that the whole country is an uninterrupted forest, the greatest part never cut. This constitutes the productiveness of virgin soils. We can safely pronounce that the greater part of the 30,000 square miles of which the provinces are composed, are fertile, or fit to be made fertile, and that only the higher parts of the mountains and the mangrove territories are sterile, the quantity of unproductive sterile, or unavailable lands, is scarcely one-fourth of the area

Which part of the province may be the most fertile, is as yet undecided, as so little land is cleared. The northern parts will have the preference as rice countries, on account of the great plains, as the southern parts will be found preferable for perennial cultivation, on account of their approaching more in climate to the equatorial regions. The complaints of natural barrenness of soil, and inaptitude for cultivation said to exist in the Malay archipelago, and so much complained of by Marsden with reference to a great portion of Sumatra, is not applicable to Tenasserim.

V *The great choice of lands* to be had, forms another great advantage in a beginning colony.

There are as yet no conditions laid down by government under which lands are given to private individuals, probably on account of no body having yet asked for land. Probably the same, or similar regulations will be fixed upon, which exist at present in the Straits of Malacca.

It should then be remembered, that the cultivation will probably take a different turn from that in India, viz that very few annual, but mostly perennial plantations will be reared, such as of spices, coffee, betel-nuts, &c and that short leases would be detrimental to the landholder.

The price of land where so much is lying waste, and where it should be the interest of government to keep as much as possible of the land occupied, will probably be insignificant in the beginning. Under the present system, borrowed from the ancient Burmese, every part of land occupied or not is the property of government, the natives merely farm it, and pay for the productions raised upon it nominally 25 per cent *ad valorem*.

VI *The greatest variety of articles which can be raised in Tenasserim* is another great advantage which the provinces offer; not only every tropical production thrives well, but also exclusively intertropical articles promise to succeed in the southern parts of Tenasserim, and amongst those, some of the most valuable known, which are confined comparatively to a narrow sphere, such as nutmegs and cloves.

VII *The combination of agricultural with mercantile pursuits* forms an additional reason to select this part of India in preference to many others. I mean, a planter can combine the sale of valuable spontaneous productions of nature which surround, with his chief pursuits in agriculture

As the greater part of valuable productions can only be obtained from plants which require several years' growth before they arrive at maturity, the time which intervenes is lost to the planter in expectations, and can be turned to account by converting into practical use the following productions, which to this day are unused, though of intrinsic value, viz —sticklac, the gamboge, the caoutchouc, the different gum resins, the wood oil, the black varnish, the aloes, and sandal woods, the native dyes, and several tanning substances, &c. &c.

VIII The last advantage which the provinces offer as a colony, consists in *the facility of getting good labourers*, though the country is thinly peopled, and the Burmese on account of their independence and want of skill will never be extensively used as labourers, yet the Chinese can be brought into the country; it would only be necessary to direct the tide of their emigration from Singapore here, and certainly if Chinese once knew that they could find remunerating employment they would flock of themselves to these shores

This is a matter of vital importance just at present, when the effects of the emancipation of negro slaves has involved the greatest part of the tropical colonies in embarrassments which threaten some of them with ruin. The advantages of having an European colony would be briefly the following —

1. It would be the best means of rendering the country in the shortest possible time remunerating. Until now it has been a loss, and though it has made a gradual progress towards the better, yet it will be a considerable time before the native population augments sufficiently to render the country a source of revenue to government. It must besides be kept in mind, that should circumstances ever allow of settled government in Pegu, the greater part of the population in the north will emigrate from Tenasserim and return to their old homes, where they will have protection

2 European settlers would soon call into practical use the manifold resources of the country

3 United with the mother country by mutual interest, England would very soon gain by a new commerce with a new country, and by it be benefited

4 When grown up to a greater community, an European colony would be considered as a safe position against millions of people inhabiting India. Of the different articles which are found in the provinces, or which can be raised, I have treated in my previous reports, I therefore confine myself to mentioning some of those which promise to become of the first importance to European settlers

*Spices* —Spice cultivation is excluded from India Proper, all attempts to transplant trees from the Malay archipelago have not answered the expectations. When the fruit ripens it is imperfect

The nobler spices seem to be confined to a narrow sphere in interequatorial climes, confined to countries which are not far distant from their native place, the Moluccas

It is only lately that the spice plantations in Penang (begun under apparently unfavourable auspices) realized the most sanguine expectations of success. They are already, and will be more in time, the true source of prosperity of that small colonial settlement

Penang has a great resemblance in productions and climate to the southern portions of the Tenasserim Provinces. It may reasonably be conjectured that almost all valuable productions succeeding there will thrive in the Meigui Province. All that hitherto have been tried, have succeeded. Young nutmeg trees are growing in Meigui very well, they are not however sufficiently grown up to know by experience whether they will be equally productive.

There is a practical adage amongst the natives, which I am inclined much to credit, that where mangosteens thrive, nutmegs will grow and bear fruit.

Mangosteens are equally obstinate regarding locality. They do not grow well in India, and produce but indifferent fruit in Ceylon and the southernmost parts of the Peninsula. They

do not grow better in the northern parts of Tenasserim, Mergui is the northernmost limit where they attain perfection, and so it probably will be with nutmegs. Should nutmegs bear amply in Tenasserim, their introduction and multiplication will be of the greatest advantage, as no branch of tropical cultivation is as yet known giving such an ample return as nutmegs.

It is probable that the high prices of nutmegs will diminish with the increase of the number of plantations, but even half of the present price would be a very ample return. It is rather doubtful whether clove trees will succeed in Tenasserim, they grow but slowly, and are very delicate. There is only one tree which has blossomed this year, for the first time, in Mergui Province.

Coffee plantations are a branch of tropical agriculture which is particularly well suited for every part of the Tenasserim Provinces. Experience has taught, that coffee plants produce amply, and that the coffee obtained is of a superior quality. Some reared by Major MacFarquhar in Tavoy can be compared with the second best in Java. The young trees begin to bear in the third year, and are in full bearing after five years. The virgin soil if cleared, and burnt down forests in valleys on the sloping sides of mountains, are the best suited for its growth. Such an article of the first importance in the European market, does not want a particular recommendation.

Areca palm plantations are also of importance to the European planter in the southern parts of Tenasserim, where they attain high perfection. They give certain returns, which are not inconsiderable, they require however seven years' growth before they produce fruit.

The natives have only since the British occupation laid out areca plantations on a large scale. The provinces do not yet produce sufficient for the consumption of the country, and the nut is imported from Sumatra, and Penang.

Should arecas, as lately they have begun, be continued to be transported to Europe for the purpose of superseding oak bark and sumach for tanning purposes, the importance of areca plantations would greatly increase.

*Cocoanuts.*—In all tropical countries, having a large extent of



sea-coast, cocoanut plantations are chiefly remunerating if the native population is accustomed to use these nuts as a part of their diet

To the European settler they are important, for the sake of manufacturing the oil for exportation to Europe. The country immediately bordering on the sea-shore is that best adapted for cocoanuts, because they require to be somewhat under the influence of salt water to thrive properly, and it is a part of the country otherwise unavailable. The borders of the mangrove jungles can be profitably employed in this way

Nipah cultivation, though never as yet carried on by Europeans, seems to call for particular attention. The leaves of this palm are used for thatching common houses, when converted into a kind of thatch the price is generally from two to three rupees per thousand. But what merits particular attention, is the making of sugar from Nipah toddy or palm wine. Experiments have shown that the quantity of sugar is greater in proportion to that obtained from sugarcane. The chief difficulty arises from the rapid fermentation which the palm wine undergoes

Nipah grows only near the sea-shore, in places which are under the influence of the tides; boats therefore can approach within a short distance of the plantation. It would be necessary to have a copper boiler on board of one of the boats, and to boil the just collected juice to prevent the vinous fermentation. In this way a great quantity of sugar could be obtained, which could be disposed of with considerable profit at low prices.

These are the chief perennial plantations which would be the most profitable to European settlers

Annual plantations are less remunerating, but the returns are quick, and the majority would probably begin with them, except men of capital, who can afford to wait

Annual plantations however require in the beginning a greater outlay than perennial. We have shown that the country with few exceptions is an uninterrupted forest. It is not only necessary with annuals to clear the forests, but to prepare the ground more carefully, digging out the stumps and roots of trees, and rendering it fit for tillage

Such thoroughly prepared grounds do not exist in the provinces except those destined for rice-plantations, and those being situated in low localities, are scarcely available for other annuals

It must be ascertained by experience whether a plantation consisting exclusively of annuals would be remunerating to European settlers. It is doubtful whether Tenasserim in its infancy as a colony, will be able to compete with Hindoostan in this respect. If however any annual plantations on a large scale are to be established, then cotton must be counted among the first. To augment the quantity of new cotton in the British colonies, and to render the mother country independent of foreign supplies, ought to be considered a matter of deep concern.

The East Indian possessions are particularly well fitted for cotton growth. India is the mother country of cotton, yet the original plant is deteriorated throughout India, and the modes of cultivation not understood. In Tenasserim the indigenous cotton plant, or that in use, is still worse than the Indian. It has a short staple, want of smoothness, and a great cohesion to the seed. The greater part of the cotton is sown together with mountain rice, upon newly burnt ground. Four-fifths of all cotton grown are obtained in this manner, almost all being used for home consumption. Other cotton seeds have been introduced since the British occupation, but unfortunately Pernambuco cotton was selected and generally distributed. It proved a failure, as might be expected from an almost subalpine plant being transferred into subequatorial plains, and the failure of the experiments contributed to make the natives think that their own species was better.

Egyptian, Sea Island, and Seychelle cotton have been also introduced lately, but almost all the seeds obtained did not germinate. European settlers well versed in cotton growth would have an ample field for exertions, and it seems that the plains between Ye and Tavoy, and between Tavoy and Palauk, will be particularly fit for the introduction of Sea Island cotton, as that variety likes the atmosphere of the sea and a slightly subsaline soil. For the Georgia Upland plant, the interme-

diatc valleys and slopes would furnish an apparently good locality We have hitherto, however, no experience whatever of cotton growth with introduced superior qualities, and can therefore throw no light upon the probability of success with cotton.

Of the cultivation of the sugarcane I have spoken in my former reports, as well as of indigo and tobacco cultivation All these articles grow well in these provinces, there are however no known data on which to base how far an extended well attended cultivation would be remunerating, as these articles have been only reared on a small scale for home consumption, and no care taken to replace deteriorated varieties

In Hindoostan a great proportion of the land is already converted into fields which are actually under tillage, and the people cultivate indigo, tobacco, and sugarcane, in this case it seems advisable to unite perennial cultivation with annual.

The following is the sketch of a plantation upon an extensive scale, which seems to the writer to combine all desired profits from cultivation in Tenasserim, and which seems to indicate the most advantageous method under present circumstances, to be pursued for transforming the virgin forest into cultivated land It is only applicable to the southern parts of Tenasserim, especially Mergui Province The first operation is the selection of an appropriated locality with reference to soil and situation. The best soil for the purposes which I am about to indicate, is that which has a layer of humus of at least two or three inches depth, whose upper soil is the red clayish earth, intermixed with a moderate quantity of sand

Localities where the upper surface is constituted of decomposed granite rocks will be found, on account of the fertilizing quantity of the decomposed felspar, highly advantageous Should a more than ordinary admixture of calcareous substances happen, as is the case in localities where isolated limestone groups protrude, it will be still better, the vegetation in the neighbourhood of such localities being always distinguished by a particular luxuriant appearance.

It ought also to be ascertained, whether there be a sufficient stratum of subsoil two or three feet thick, not rock

Undulatory, slightly sloping hills, and of these chiefly the part near the bottom of the valley, will be the best situation

Places must be avoided where the waters have not a natural outlet, otherwise they accumulate during the height of the monsoon, besides a noxious inundation, the plantations are liable to be carried away with the good earth, the formation of terraces, and the digging up of trenches and drains, would be for the first settlers a too expensive operation, where unlimited quantities of unoccupied land can be chosen in the first instance.

Particular care in the selection of the locality should be taken to establish the plantation not far from the sea coast, from a navigable river, or at least near a creek communicating with the sea, or river, there being no roads in the country, and the easy transport of the produce being a matter of importance

Localities should be chosen where the forest is high The more primitive woods are grown up, the more they possess of accumulated humus, and the less they have of underwood,—the more underwood, the less good the soil, and the greater the number of white-ants, the greatest enemies to a plantation in tropical countries

After having selected the proper locality, the cutting down of the forest is the next operation. It can only be performed during the dry season, from November to April, trees cut down during the monsoon do not burn well, this is a fact of which it is difficult to account satisfactorily

The great art in cutting consists in felling the trees in such a manner that they fall in heaps, when they are lighted they burn the more freely, for the greatest trouble does not consist in felling a forest, but in burning it.

A month before the setting in of the monsoon, the whole area cut down is burnt in one day, after this, the always considerable remainder of the branches and smaller trees is cut again, and brought on new heaps, which are repeatedly burnt down, until nothing remains but the bare large trunks, which are never consumed by the fire.

In future times, when wood will be more appreciated, part of these trunks, 30 or 40 feet in length, quite straight, some species yielding excellent timber for ship-building and other purposes, will probably be removed to well situated localities, where they can be dragged by elephants to the water's edge. For the present, there is no demand for timber, and these large trunks are left in the plantation to rot. The aspect of such a plantation cleared and prepared, is not agreeable to the eye of an European accustomed to see clean fields; the standing and strewed large trunks prevent the application of the plough, but in the present description the most profitable mode of plantation is kept in view, and this does not require the plough, for such a plantation is not to become a field, but a garden.

The next aim is to render the prepared soil as productive as a virgin soil can be made. It is not yet ascertained by experience whether it is not advisable to sow in the first instance mountain rice, not only on account of the produce obtained covering at least a great part of the expences of cutting down the forest, but also on account of being a powerful check to the shooting up of numerous weeds, after a few months, notwithstanding constant weeding. The natives affirm that the quantity of nutritive matter of which the rice deprives the soil, is less than that consumed by the weeds.

If rice is not planted, sesamum oil-seed is sown broad cast upon the ashes, young chilli plants planted in rows, and cut pieces of yams planted like potatoes at intervals

These annual productions enter into the domestic economy of a tropical planter, and the surplus, if the country be inhabited, is bought up by the natives, the labourers also, in most cases, consent to take a part of their wages in kind, instead of money.

The next is the planting of plantain shoots. This plantation is formed on account of the shade which the broad leaves of this plant throws over the young perennial plants, shade being a most necessary requisite in the dry season, and plantains shooting out the quickest, without detaching much nourishment from the soil, and are besides otherwise useful

They yield, as is well known, an astonishing quantity of

wholesome food They are cut down after the perennial plantations attain the height of four feet six inches, when they are strong enough to bear the dry season unprotected, and the burnt plantains yield a considerable quantity of potash. At the same time that the forest is cleared and prepared, a nursery for young areca palms is to be established in some appropriate locality. The best arecas for seeds are to be obtained from December to March, and sufficient are at present grown in the southern provinces, so that seed is always procurable Such as are the largest and apple shaped, are considered the best for planting They are placed in baskets in layers, covered with leaves or hay, from 500 to 1000, closely packed together, these baskets are kept in cool places, and watered at least once a day

The outer husk of the areca nut consisting of fibres and a pulpous matter, begins in a short time to ferment and to decay, the nut loses its bright orange colour, gets dark, and after its epidermis is rotten, it remains enveloped in a mass of closely woven fibres

The fermentation accompanied with a considerable degree of heat, is deemed necessary to further germinations, which become conspicuous after about one month. In about two months, or later, the nut has shot forth a sprout, about an inch in length This is the time to take the nuts out of the baskets and to plant them in a nursery, at a span's distance from each other, only half covered with earth. In the latter end of June or beginning of July, they are transplanted into the plantation in the spot where they are to remain for ever They are then generally one foot high, and have shot two or three leaves in the nursery. They ought to be planted in rows at least seven cubits distant, this being about double of the diameter which the crown of this slender palm occupies, and which is necessary to leave ample room for ventilation At the time of planting, care must be taken that the weather promises rain for a succession of several days Should an interval in the monsoon take place, which is generally accompanied by a most powerful sun, the transplanted arecas die or suffer considerably The arecas are the first of the perennial plantations to be taken care of, and they will be found very advantageous. The profits will not

be exorbitant (about four per cent per annum net gain from one tree), but the planter has the advantage of using the ground without much reference to the arecas, as they derive the greatest quantity of their nourishment from the air.

In the course of time, the palm rises with its roots above the ground, which latter are covered with mammillary varices, constantly removing and absorbing during the night their appropriate nourishment.

The palm does not yield fruit before the seventh year, and continues productive 25 or 30 years. After the first planting no further trouble is requisite than to loosen the ground once or twice a year, without the necessity of manuring or watering, provided the young plants have shade the first and second year.

The next to be done is the planting of coffee. Coffee is not yet introduced in sufficient quantity to have a certain number of seedlings available. Sprouting coffee seed ought to be procured from Calcutta from the coffee reared in Mocha. Young coffee plants can also be obtained from Penang at a very moderate price, and they arrive in good health, the passage being short.

Sprouting coffee must be laid out in a nursery, and the coffee trees transplanted when at least a foot high. No particular care is requisite, except that the roots are sunk vertically in the loosened soil, the slightest curve of the tap root of the coffee producing a sickly tree.

The coffee is to be planted between two rows of arecas, the lateral branches of the coffee extending far, and requiring room for expansion. Between each 1000 arecas 500 coffee trees can be planted without prejudice to the soil, as the coffee tree sinks its roots deep in the ground, and thence derives its nourishment. In the first instance the plantains afford shelter to the coffee, in after years the crowns of the arecas. Areca and coffee being planted, the attention is next to be directed towards the spice trees. It being however problematical whether clove trees will succeed, I confine my observations to nutmegs. Twenty paces apart from each other, holes are to be dug, at least four feet deep and  $1\frac{1}{2}$  in diameter, and these are afterwards to be filled with the best procurable earth, such as humus, in preference to cow or buffalo dung mixed with earth,

at least a year old, or the best of all, the rotten husk of paddy mixed with earth, yielding a rich vegetable mould, which in the neighbourhood of Burmese towns or villages is always to be obtained.

The nutmeg tree has a tap root descending perpendicularly to a great depth, and which furnishes the chief nourishment. To permit this root an easy penetration downwards, feeding it in the best possible manner, is the reason why these holes are dug

Considering the very great value of a nutmeg plantation, all the care and necessary outlay are trifling compared with the return. Nutmegs must be procured from Penang. In the Tenasserim Provinces they are scarcely obtainable, and only at an exorbitant price. When the holes are prepared the spice plants are to be transplanted from the nursery, but such only selected which have at least obtained the height of one foot. Each tree separately is to be surrounded with a frame-work of sticks and lateral shades, to be made from nipah palm leaves, the top only loosely covered with leaves, to permit the dew to penetrate, and in the dry season an earthen vessel is to be suspended over the young tree, perforated with holes through which constant moisture is made to drop upon the young plants. All these operations should, if possible, be performed in the first year, to save time.

A careful weeding, if paddy is not planted, is unremittingly necessary the first year, to eradicate all plants the seeds of which germinate very easily in the much loosened and rich soil. There are plants which are particular to newly cleared places belonging to the families of Tiliaceæ (*Triumfetta* the most common) Malvææ, Gramineæ, Convolvulææ, &c &c which are certain to be found even in the centre of a primitive forest, in cleared places where before, not a specimen of these species could be found for miles in the vicinity. Most of the roots of the burnt down trees shoot again, and must be twice or thrice destroyed before the roots decay.

In the second year, annuals can yet be reared in the intervals between the young trees, chiefly sesamum oil plants, cotton, and indigo; it would however be detrimental to take from the soil



more nourishment in the third year by again planting annuals. By this it will be perceived that a plantation laid out in this way does not yield a return before the seventh year; but that the revenue then increases in such a ratio, if laid out on a somewhat large scale, as to render the planter comfortable and independant after ten years.

The first and second year the settler will scarcely gain more than his livelihood by the value of the annuals, from the third to the seventh, the coffee alone will remunerate him, after the seventh year the arecas begin to bear, and after the eighth begin the crops of nutmegs.

A plantation of 50,000 arecas, 25,000 coffee, and 7,500 nutmeg trees would therefore yield as follows —

*Annuals*

|                                                                      |          |
|----------------------------------------------------------------------|----------|
| 1st and 2nd year, .                                                  | Trifling |
| 3rd year coffee at an average of two annas net profit from one tree, | 3,125    |
| 4th, 5th, and 6th year,                                              | 3,125    |
| 7th, 8th, and 9th year, arecas at 4 annas per tree                   | 12,500   |
| Coffee,                                                              | 3,125    |
| Total,                                                               | 21,875   |
| 10th, and following 7 years, nutmegs at 10 rupees per tree,          | 32,500   |
| Arecas,                                                              | 12,500   |
|                                                                      | 45,000   |

It must be observed that the calculation is taken from 3,250 instead of 7,500 nutmeg trees, which the colonist originally planted, because half these trees will probably be males, which are useless, and are to be cut down, except one for every twenty females, which is quite sufficient to impregnate them.

It is to be lamented that we know as yet no distinguishing mark to discern a male or female nutmeg tree before they blossom. It is therefore necessary to plant 3,250 young trees more, which after 8 years will again turn out half males and half females,

and so it ought to go on, till nothing but females, with a proportionate number of males, are obtained.

It will also be seen, that in the last calculation no notice is taken of the coffee trees.

When however the nutmeg trees grow larger, it will be advisable to cut down the coffee trees, to leave room for the expansion of the first, much more so as the return from coffee is trifling compared with that of nutmegs

The same is to be observed of arecas, which after twenty-five years begin gradually to produce less, they ought also to be destroyed, to leave nothing but nutmegs, which continue to yield annually more

Nutmeg trees are said to grow eighty years, and to attain a very large size, we have however no proofs as yet that they will be in these latitudes as lasting as they are in their mother country

The return of nutmeg plantations increases annually, and in after years is much higher than ten rupees per tree. There are trees in Penang, which yield annually from 30 to 40 dollars, though not yet full grown. They bear almost without intermission throughout the year

It would be advisable to use the slender stems of the dead arecas for the purpose of training upon them the pepper vine, it is however rather probable, that a planter who gets such an ample return from his nutmeg plantation will not take the trouble of beginning a new mode of cultivation with pepper, which after all does not last more than three or four years

This now detailed method of cultivation seems the most promising to be followed up in the southern parts of Tenasserim by European settlers, insuring the most solid and ample return of the outlay of the capital, surpassing by far the most ample revenue the sugar plantations in the West Indies ever yielded. Spice is a new branch of tropical agriculture, or rather horticulture, sprung up only in the course of this century; formerly the Dutch government monopolized it exclusively. Penang is hitherto the only British colony which has introduced it, and which begins to astonish the world with the immense profits the owners reap from it. It must however be considered,

that only men of some capital are able to begin such plantations, as they must be able to wait at least seven years before they begin to see the profits of their outlay and industry. Formerly nothing was introduced, and nothing cultivated in the provinces, that did not spontaneously occur, except some fruit trees and some of the most common articles of tropical agriculture.

Of American productions, tobacco, pine-apples, guavas, and anotta (*bixa orellana*) are universally diffused. The durian tree which forms the greatest delicacy among the Burmese, was introduced from the Malay countries, after this came the mangosteen from the same quarter. Though arecas are every where planted in the provinces, they are not extensively planted, and the climate above the 15th degree of latitude seems no more congenial to them. In Mergui Province, since the British occupation, plantations on a large scale, even as much as 10,000 trees, have been laid out by the Burmese, and are augmenting annually.

Mangosteens are a later introduction, and are attended to by the Burmese with great care in Mergui province. Scarcely one-twentieth part of the trees planted are yet bearing.

The Burmese would certainly also plant nutmegs and cloves if they could but procure them. Government would therefore confer a great boon on the natives, by establishing in the southern parts a nursery of productions from the Malay and other countries, and divide them gratis to a deserving people. A kind of practical botanical establishment, on a small scale, would be highly useful.

In this should also be cultivated many of the wild growing trees, deteriorated in their jungly state, gradually to be domesticated by cultivation, and then exported to other parts, or laid out in experimental plantations. Such are the various kinds of caouchouc yielding trees, the wild gamboge, the sandal-wood trees, the sassafras, the black varnish, the cajeput-oil tree, &c. &c.

Many plants from the Malay countries when first introduced into Tenasserim, (considering this, as an intermediate stage), could be from hence transplanted to Bengal and Upper India as it has been generally observed that a gradual ac-

climation is highly advantageous to the introduction of plants of different latitudes. The establishment of government spice nurseries, would be but following the Dutch system now introduced into Java.

The government monopoly there has been discontinued, and the private establishment of spice plantations encouraged, the government not only promising to supply every person with all plants required, gratis, but also to give instructions and directions how to proceed to ensure success. How much government would gain by such a process, shewing at the same time that the natives are not averse to introduce new modes of cultivation, can easily be illustrated.

Areca plantations are but a new branch of cultivation in the southern parts of Tenasserim. Ten years ago not more than 60,000 trees altogether were planted, the number rose in 1837 to 40,000 bearing trees, and 80,000 newly planted. In the year 1839 about 30,000 more were found. The customary tax due to government upon all produce is 15 per cent.

Suppose that instead of 150,000 areca palms, so many nutmegs were planted, which when bearing yield from 10 to 30 Rs. a tree, each tree taken at 15 Rs. average, the amount of revenue, the government levy, according to the established rule, would be 150,000 Rs. annually from the spice bearing trees alone. Of the necessity of planting out teak forests, I have spoken in my former reports. Without regular new plantations, the teak forests in Tenasserim will soon be exhausted.

One of the greatest riches of the country is derived from its teak forests. Except the teak no other timber is used, a small number of junks annually built by Chinese and other small Burmese craft constructed in Tavoy and Mergui from thingan (*hopea odorata*) excepted.

The researches carried on this year in the southern parts of the provinces, and amongst the islands, have shewn that this part of the country also is an uninterrupted forest, overgrown with almost the same species of timber which occur in the north. The greatest part of the timber trees valuable for ship-building belong to the *Dipterocarææ*, and this family has more representatives in Tenasserim than any where else, the *Hopeas*,

*Vaticas*, and *Shoreas*, are the most valuable. The *Dypterocarea* though attaining an enormous size, furnishes an inferior wood

All these trees, when full grown, are from 70 to 120 feet in height, rising with a straight trunk 40 or 60 feet high, and have, before they throw out any branches, a circumference from 10 to 30 feet

Teak having been hitherto procurable, and prejudices being entertained against other species of timber, nobody has as yet endeavoured to turn the immense forests of the provinces into practical use.

So greatly is the timber neglected, that in all Tenasserim not one saw mill is as yet established, and strange to say, planks for house building are transported from Penang To engage in timber with a prospect of success, would however require a considerable outlay of capital Either a timber trade should be kept solely in view, or ship-building united with it Ship-building has started up in Maulmain, is increasing, and is the only branch of enterprise in Tenasserim which occupies Europeans; it is however yet in its infancy, and capable of great extension

If we except the teak, no other timber trade is carried on. The daily increasing demand for timber in Europe, Bengal, Madras, Mauritius, Cape of Good Hope, &c however, will not permit the forests of this country to remain long unused. A great advantage towards rendering these forests useful, will be found in the great number of rivers and rivulets whose banks are covered with forest trees, and which will afford great facilities of transport.

Not only the inland parts, but numerous islands of the archipelago of Mergui are covered close to the sea-beach with forests, and frequently it will but be necessary to fell the tree, so as to make it fall into the sea, or to drag it only a few paces to the water's edge.

The establishment of saw mills moved by water, will present great difficulties, the sudden rise during the monsoon is dangerous to the strongest dikes, and it would be less profitable to erect saw mills at a distance from the sea port.

Saw mills propelled by steam at the mouths of the larger rivers, seem to promise the best The felled trees bound

together in rafts could be easily floated down, and by way of the sea, the forest trees from several rivers could be collected at one establishment

*Tin.*—In the preceding reports I had the opportunity of speaking about the tin mine to the east of Tavoy, and of the tin found near Mergui. This year having examined the country to the south of Mergui, it was found that the country to the north of the Packchan river is the richest in tin ores of all the districts in Tenasserim. The range of mountains in which the tin ore is found, is a continuation (only divided by the Packchan river) of the Siamese tin territory of Rinowng. The tin is found in the debris of primitive rocks, like in all other parts of Tenasserim, but the grains or crystals are much larger (sometimes of the size of a pigeon's egg) and the soil in which they are buried, yields 8 to 10 feet of tin, while at Tavoy the utmost is 7 feet. There is also tin at Domel Island in crystals, still included in the granitic matrix, and likewise on the banks of the Boukpeen rivulet in its higher part. In fact tin is of a very common occurrence in the southern parts of Tenasserim, and probably its richest deposits are yet unknown.

Persons of capital desirous of engaging in the working of tin, cannot select a better locality than in the southernmost parts of Mergui province. Besides being the richest, almost all land transport is avoided, by colonists establishing themselves on one of the smaller rivers falling into the Packchan.

They would however be obliged to provide themselves with every thing from a distance, for the country is entirely uninhabited, and the labourers must be brought thither from other parts.

Were a village under English protection established somewhere near the Packchan, there is no doubt that a number of Siamese fugitives would settle in the neighbourhood. They have expressed their desire to do so, if hopes of being protected were held out to them. If we consider the value of tin, it seems probable that this product will be one of the first which will attract the attention of Europeans, when it is once known that tin, as it is now ascertained, does really exist in quantities which promise amply to remunerate.

*Iron.*—All parts of Tenasserim are rich in iron. The localities and species of iron found on the main land, I have described in my former reports, and have only to add, that iron occurs equally upon the islands of the Mergui archipelago.

There have been found by me this year, four great deposits or beds of iron, the first about three hours from Mergui, at Maoin, and probably a continuation of it near Pereghuon, the second not far from the entrance of the Lennya river, at an island called Kala-khung by the Burmese, the third (the richest) on two islands (no name) to the west of Sir John Malcolm's island, the fourth on White Pigeon's Island, to the north of the Packchan embouchure. The ores if smelted, would furnish from 40 to 60 per cent of raw iron. The iron of Tavoy remains however the best with reference to per centage (74 to 80 or more) quality, and the preference should therefore be recommended to those who may be inclined to establish iron foundries.

It is to be hoped that such a valuable article, to be had under circumstances where fuel is but a matter of trifling consideration, will attract the attention of enterprising Europeans with capital.

To the mineral articles of the provinces must be added copper, discovered this year in two localities. The first in the NE part of the great Lampi or Sullivan's Island, found in veins of quartz, running through transition clay slate, the second in the island of Calla-gkiauk, near Meigui, in a quarry running through gneiss.

Both have been obtained, but in small quantities, the prosecution of researches carried on by mining was not intended, but the bare indication of the occurrence of copper will be found sufficient to those who are desirous of turning their attention to this valuable mineral.

Before the invention of the steam engine, and before this invention was brought into universal application as a substitute for human labour for achieving works previously unknown, or thought impracticable, coal was nothing but a cheaper fuel than wood, and only of advantage to countries destitute of forests. In those abounding with timber, coal was useless.

In the same light the discovery of coal would be considered in Tenasserim. The country densely grown with the finest forest (at Mergui 100 billets of wood 9 feet 6 to 10 inches in circumference, are to be got for 9 Rs ) the population extremely scanty, in a primitive state, the country without manufactures and without commerce, the discovery of coal is therefore for the present of no use to the country

Coal however being indispensable for steam purposes, the discovery of coal becomes highly important to the country indirectly, and to the whole of India directly

For steamers navigating the coast, and going from Maulmain to Rangoon, Tavoy, and Mergui, coal is no great benefit

Not above a four days voyage in a steamer can be performed with wood, an eight days trip from Maulmain to Calcutta is impracticable without coal, and the millions of timber trees in Tenasserim could not have contributed any thing to the accomplishment of a steam communication between the different parts of India

The accomplishment of the Comprehensive Steam System between the different parts of India and Europe, will in a short time render coal in India a matter of first importance, and Mergui coal, of all hitherto known localities of coal deposits in India, will be the first

The peculiar advantages with reference to quality, quantity, and locality, have been pointed out in my previous reports, it is only necessary to add, that the discovery of a new deposit, almost on the banks of the great Tenasserim river, not requiring land carriage (except a distance of 1000 yards) will cause a considerable diminution in the cost of the article, and will cause still larger quantities to be brought to light than previously would have been perhaps the case

When Mergui coal is brought into general use, it will exercise a great influence over the other coal fields in India

The Burdwan coal supply will be limited to the use of steamers on the Ganges and Burhampooter, and in consequence, the prices of coal used in inland navigation will rise to make up for the defect caused by the discontinuance of exportation.



The Palamow, and Cherra-Poongi coal-fields will either be given up entirely, or if they can compete with the Burdwan coal in cheapness, the latter will suffer still more, the quality of the former being superior, and the demand for coal for the river navigation in Hindoostan as yet so limited, that one of these localities can supply all the wants

The importation of coal from Europe will probably cease entirely in time, for it would be very strange indeed, and only the effect of very bad management, if coal-fields well situated, with a material of a superior quality in the hands of one and the same nation, and many thousands of miles nearer to the place of consumption, should not render India altogether independent of Europe.

The first expense of the opening of the Mergui mines will be considerable, and the prices in the beginning high, either the Burmese must be employed, or a population introduced (Chinese suiting the best) In both cases the wages will be high—Burmese, independent in their character, and provided easily with all the wants of life, and induced only to work for high wages, and Chinese to be introduced into a new country, must in the beginning also be enticed by the prospect of higher wages than they can get elsewhere

The expense of machinery and the setting it up, will be greater than in any part of India, vessels arriving empty will only carry coal for higher freight, and counting only to be remunerated by the return cargo

These are the difficulties which will throw themselves in the way the first years, but gradually the coal will become cheaper

Coal could be turned advantageously into use, by working the mines of iron in the neighbourhood of Mergui with coal, the nearest one is but a few hours distant Mergui will undoubtedly become a considerable place, colonists ought to be advised to settle in the neighbourhood, and men of capital to resort there in preference.

1. It being that part of the country which possesses the coal mines.

- 2 It being peculiarly adapted for perennial plantations, and alone fit for the introduction of spices

3. It being well situated for commercial intercourse overland with Bankouk, and in general with the population scattered along the gulf of Siam, being placed in the narrowest part of the Malay peninsula

Besides the rich mines of the country, there is also antimony, silver, and gold, in the country, which are, however, to men of capital of minor importance

Antimony will perhaps be worked, if Maulman continues to be a flourishing settlement, on account of its neighbourhood to that place. The silver mine to the north of Maulman is too engirded by the mountains, and its value as yet too problematical to recommend it to private enterprise, and gold is to be found in too small quantities in the rivers to merit attention

The fisheries are not unimportant, as may be well expected in a country which possesses 600 miles of sea-coast, but they are the most considerable amongst the islands of the archipelago of Mergui, where the young brood find an appropriate shelter between the inner islands. In the month of February and March, the sea is covered for miles with a green mucilaginous mass, which envelopes myriads of spawn, the variety of fish is great, and Mergui is famous for the most delicate species

The fisheries are farmed out to the natives, Malays and Chinese share in this occupation, but it is carried on on a very diminutive scale

During some periods of the year the fishermen retire to certain spots on the uninhabited islands to the south of Mergui. It is however, done very imperfectly, the fish is spread over a framework of mangrove trees, and permitted to dry in the sun, being daily trodden with the feet twice. No salt is ever employed in the curing of fish. Certain kinds of fish are bought in the market smoked.

They have small and imperfect nets, these being sufficient to get the quantity desired near the towns and villages; fish are caught in stakes

Some little fish oil is also collected. It seems that a fishery carried on by Europeans, on a similar scale with that of Newfoundland, would be much more remunerating, as a ready market here and in India will always be found, cured fish forming an univer-

sally relished condiment and ingredient of the native dishes. It must be remarked that whales are not uncommon in the Mergui archipelago. There are pearl banks to the south of Mergui, two were worked once at the time of the Siamese occupation, one situated on the east side of Sullivan's Island, the other on the east side of *Colhe* (?) Island, stretching across to the main. This occupation is said to have formed a considerable source of revenue to the government.

Once an attempt was made by Mr Maingy, the commissioner, to revive the pearl fishery, but it was given up for want of divers accustomed to dive to great depths, the best pearl shell-fish being found at the depth of ten or twelve fathoms. This source of revenue lies entirely dormant at present. The natives are ignorant of the necessary proceedings.

Sometimes pearls of a middling quality are found by the Seelongs in the indicated localities at low water, and these bartered to the Chinese who traffic with the remnants of that race. How far it would be remunerating to men of capital to engage in this pursuit, can of course not be said at present, as even the extent of the pearl banks is not known, as well as the quantity obtainable from shell-fish attached to rocks at a greater depth.

The edible birds' nest caves form a not inconsiderable source of revenue to the provinces in the southern parts of the Tenasserim Provinces.

They are at present farmed out to Chinese and Malays, those in the Mergui archipelago are again farmed out to other Malays, who come from Penang during the dry season to watch the caves, and to build and repair the frameworks necessary for collecting the birds' nests attached in the sombre caves, on the most lofty, dangerous, and inaccessible parts. This branch of occupation it seems does not suit Europeans, and will probably remain for ever in the hands of Chinese and Malays. Irregularities will occur as long as the localities which the swallows frequent are not ascertained, which is the more difficult as these birds change their abodes; so that many caves (such for instance in the Elephant rocks to the SE. of Domel) are now almost entirely deserted.

To these productions of the sea, which enter into the article of commerce, must be added tortoise shells, mother o'pearl shells, sea-slugs, and amber, which are found among the islands of the Mergui archipelago, and which are entirely neglected, or triflingly collected by the wandering Seelongs.

*Commerce* —For commercial men (Europeans) the Tenasserim provinces are a poor resort. In a new country it requires a long time before a regular commercial intercourse can be established, whereas in Tenasserim reciprocity is wanted.

The Burmese have been too long separated from India, and much more from Europe, they know little of the commodities of either country, and they know not how to use them. What they want for their own comforts, and do not produce themselves, is all found within the sphere of their own country, what Tenasserim does not produce of their luxuries, superfluities, or commodities, Pegu and Ava do. Very few articles of European or Indian produce have found their way to Burmah. These few articles are limited to cotton piece goods of an inferior quality, some broad cloth, iron, tobacco, and opium, and the majority still use their own home-spun cloths, and content themselves with inferior tobacco, while only a small portion of the community (chiefly the richer class) indulge in smoking opium. All the rest of the commodities imported is for the use of foreigners in the provinces, and these being comparatively few, their wants are soon satisfied.

The generality of the Burmese people have no inducement to become acquainted with foreign commodities, they are too widely different in their habits, customs, and wants, from Europeans, and they possess as yet no ambition to procure the new luxuries; they have besides no reason to exchange their surplus for new articles. Yet Burmah in general, and Tenasserim considered as a part of it, might be a country of commercial importance, possessing many articles intrinsically of value, which would be appreciated in European markets, and which require only to be collected, being partly the spontaneous productions of nature, which are now entirely unused, and will remain so as long as there exists no mutual commerce. Even supposing that the natives could be induced to collect these articles at a reason-

able price, vessels that would arrive to carry away that produce have nothing to bring, and consequently their profits would be doubtful. Under such circumstances, trade will only be confined to Asiatics, who are much better fitted to provide the natives with the little commodities they are in want of from foreign parts

Should the provinces become a resort of civilized men, whose wants are more numerous, and with whom commodities are become by force of habit necessities, then commerce will spring up, and the resources of the country, the spontaneous productions of nature, as well as the produce of the cultivated soil, will be called forth in a short time

The Tenasserim Provinces are well situated to become a commercial emporium, they could be made the intermediate link, uniting the Chinese world with India and Europe

An overland communication between China and the British Indian possessions has long time been deemed very desirable. From two points there is a possibility of accomplishing it, either by way of Assam, or by way of Tenasserim. Though Assam is much nearer to the Chinese dependencies, yet the nature of the country to be traversed seems to throw such difficulties in the way, that it is not thought of at present. Maulmain is much more distant from China Proper, but there are, as far as is known, no great natural difficulties to overcome, to establish a commercial road at least with Chinese Yunan, the southernmost province. The Chinese themselves seem to be desirous that it were accomplished, and the fact that a Chinese caravan was actually on the road to Maulmain, corroborates this opinion

The difficulties are only of a political nature, and are to be sought for in the jealousy of the Burmese and Siamese governments, and the apprehensions of the Shan states, to the north of Amherst Province. Should the relations with Burmah be placed on a solid footing, there is no doubt that an overland trade with China and the British Indian possessions would spring up. Chinese caravans come annually to Burmah, and within a short distance of the northern parts of Tenasserim

The articles most in demand, would be European and Indian

goods of little bulk, such as opium, piece goods, cotton yarn, and bullion, and they could be sent into the interior parts of China in this way more direct than at present, for all articles imported by British vessels must be from the sea ports to the distant inland provinces of China, and though it seems at first sight to be a very long journey from Maulmain to China, yet it is a shorter one for the western provinces of Yunan, Mungfan Kahang, and Amdoa, than through Canton, and several of these, which are unable at present to get these goods at all, could be provided with them in this way.

If the Chinese import from Burmah now almost nothing but raw cotton of an inferior quality, which is very bulky, how much more would they be inclined to transport the above mentioned articles.

The Russians set an example in their trade with China; their communication embraces the longest known commercial overland road—from Astracan over great part of Siberia, to Kaichta, from whence they have to pass the Duary Mongolian steppes, before they reach the great wall, the entrance to China Proper.

The distance from Maulmain to the southern parts of China is trifling, compared with the Russo-Chinese road of commerce. The southern parts of Tenasserim are well situated to carry on a commerce with Bankouk. The British intercourse with Siam has been greatly neglected, which is the more to be wondered at, as that country abounds in most precious articles, and its ruler seems to patronize commerce. The treaty concluded with Siam does not preclude British Indian subjects from trading overland, there has been however hitherto no inducement to do so. Mergui would be the place to carry on a trade across the isthmus, which in a straight line does not there exceed eighty miles, thirty at least of which, as far as is known, can be accomplished by water on this side. The country does not present any great difficulties, and a road formerly existed from Tenasserim across the country, which Alompra followed with his army, marching to besiege Bankouk. Should such a road be opened again, it would call into operation the coal mines discovered last year—which are situated on this road, not far from the Siamese frontier, which for the present

remains unused—as the late discovered locality of coal presents far greater facilities for transport.

Should the Tenasserim Provinces advance in prosperity, it is very probable that the gulf of Siam will be united with the bay of Bengal by a railroad. To form a canal through the isthmus of Kraw, as has been once proposed, would rather appear a chimerical undertaking. I had opportunities of examining that portion of the country this year, navigating the Pakchan river as far as it is navigable for vessels of some burthen, and the natives informed me that an interruption exists in the range of mountains, which runs through the peninsula, and that another navigable river (Telim-foung) is met with at a distance of six hours march on the other side, but whatever localities might be chosen to traverse the peninsula, a railroad in a tract of country abounding with timber, iron, and coal, would at any rate be preferable to a canal

For the present such an undertaking must remain a theoretic scheme, it would only be recommendable in the event of Tenasserim being occupied by European settlers, the relations with Siam, as a country full of resources, better understood; and the commercial intercourse with China not only re-established, but also become more vigorous, and still more extensive. In the latter case a speedy communication between China, India, and Europe, and across the peninsula, through Tenasserim, would be very beneficial.

*Recapitulation.*—Recapitulating what has been said in the foregoing pages, we are led to the following conclusions

1. That Tenasserim is particularly well situated for an European colony, on account of the quantity of good land unoccupied, the variety of tropical productions which can be raised, the salubrity of the climate, and the facility of communication, possessing a large extent of sea-coast with numerous navigable-rivers

2. That the natives will be no impediment in any way to European settlers, as they are in many respects in Hindoostan.

3. That Tenasserim therefore ought, in preference to any other part of British India, to be chosen as a resort for Europeans who are desirous of occupying the land as agricultural settlers

4 That it possesses, besides, great inducements to men of capital to employ their money productively here, the timber forests, the tin, iron, and coal mines, besides other spontaneous productions of nature, being inexhaustible riches of value

5 That mercantile speculations cannot be remunerating at present, there being scarcely any demand for foreign produce

6 That the situation of the country is such, as to point it out as the commercial high road in the north between China, and in the south, between Siam and British India

NOTE —The MS from which this valuable report was printed abounds with copyist's errors, on which it has been sometimes impossible to venture even a conjectural correction



*Memor on the Climate, Soil, Produce, and Husbandry of Afghanistan and the neighbouring Countries —By Lieut IRWIN*<sup>1</sup>

#### PART IV (Continued)

##### Toree

209 The climate is here milder The chief products are rice and mash The lands are irrigated, the houses flat-roofed, timber, fuel, and fodder are easily had. The chief live stock is goats, and next, cows and buffaloes The carriage is by mules, and the natives carry rice and mash to Cabul from their own valley, as also salt from the eastward The cultivation is considerable, and the villages Zeran and Koorman are long ones

##### Upper Bungush

210 This country seems to correspond in most circumstances to that of Toree The chief town is Honga, which has 400 houses The country is strong, and is under its own chief, whom the king seldom displaces. It yields good honey, and is well wooded and watered. Rice is exported to Cabul, generally by the road of Ghorbund. The valleys are well inhabited. But little use is made of tents.

<sup>1</sup> Continued from p 65, vol ix



*Khost, &c.*

211 Khost and some neighbouring vallies are well watered, and the chief product is rice. The mountains which confine them, afford the natives plenty of timber, fuel, and pasturage. Cows, buffaloes, and goats are the chief stock. Little information is to be gained concerning this part of the Cabul dominions. It may be observed of the eastern parts of that monarchy, that the middle portion of it although not remarkably unfruitful, contributes very little either in men or money to the public strength. Tamerlane made his march to India from Toorkistan through Ghuznee, and thence by the road called Hazar-durukht, which penetrates the Jadran range, he reached the low country, which is watered by the Koorm, and its numerous branches. In modern times, Cabul is a place of more note than Ghuznee, and the northern road to India through Cabul and Peshawur is the frequented one, in every point of view it is preferable to the middle one. The great southern road from Persia and Khoorasan leads through Candahar, either to Deraghzee Khan or to Shikarpoor, and it is also preferable to the middle one in most points of view. The vallies of Khost, &c. are well cultivated, and their lands irrigated. In former times a greater number of Ghiljies resorted to this quarter for pasturage in the winter than now.

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*Jadrans, &c.*

212 The Jadrans and Mookbuls live in a rude state, in very small villages, and their chief subsistence is from their flocks of goats, after which, we may reckon their fields, which yield them wheat, rice, and some other things, and are in general irrigated. They receive some provisions from the Jajees and Torees, after whom the vallies of Jayce and Toree are named, and merchants from Cabul carry cloths, &c. into their country, bringing back ghee of goats' milk, and some goats. The country is very strong, and never pays revenue, nay, in the present low state of the royal authority, certain petty chiefs of the Jadrans have compelled their neighbours on the skirts of the table land to pay them revenue instead of the king. They use partly houses and partly black tents, which they make for themselves of goat hair.

*Foormul.*

213. This is a small district, but has been mentioned in history, and has found a place in maps already existing. It is situated near the junction of the Jadran range with the range of  $32\frac{1}{2}^{\circ}$ . It is drained to the eastward into the Koorm, whereas the country called Zoormul, which lies west or north-west of it, composes part of the table land of Ghuznee, and is drained south or west. The inhabitants of Foormul speak Persian, and reckon themselves 4000 families. The chief town or village is called Orgun, and may have 1000 families, there is no other village of any importance. The people subsist by tillage, and also carry on a considerable trade, conveying salt and iron from the eastward to Cabul. Their chief stock is perhaps cows and goats, and camels are the chief carriage. Their hills abounding in pine, timber and fuel are easily procurable. Their houses are flat roofed. They raise quantities of good apples, and sell a small quantity of grain to their eastern neighbours, the Wuzceerees.\*

The chief products are wheat and barley, and they raise a little maize.

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*Kohat*

214. This is an agricultural country, and the two crops are probably equal. The chief products are rice and wheat, some provisions are exported to Peshawur. The lands are commonly irrigated, and that chiefly from springs. The wheat and barley are autumn sown. For fuel they burn olive and shrubs, and timber is procured from Upper Bungush. The houses are flat roofed, cows are the chief stock, and camels the chief carriage. The inhabitants drink chiefly from springs. Kohat may have 5000 inhabitants. The villages are small, and on a given surface the populousness of their districts is less than that of Peshawur. At Kohat they cultivate grapes, figs, and mulberries, and but little other fruit, the perfume they extract from that species of the willow called Bedi mookh, is much esteemed.

\* These live in a rugged country, and derive their subsistence from tillage and from flocks of goats.

*Malgeen*

215 In this country, which belongs to the Southern Khutuks, the chief subsistence is from tillage; near Malgeen there is more rubbee, and wheat is the chief crop, but near Toree, which lies on the road to Bunnoo, the khureef is greater, and bajra the chief crop. Very few of the fields are irrigated, some bajra is said to be exported to Bunnoo, and a great part of the kingdom is supplied with salt dug in this district, the trade of salt is chiefly in the hands of strangers. The villages are generally small, and there is much waste; for fuel they use shrubs, and they drink from streams, springs, and tanks. In the quarter of Toree are some wells, cows are the chief stock, bullocks and camels perhaps the chief carriage. The natives live in flat roofed houses; those who visit the neighbouring hills in summer, use, I believe, partly black tents, and partly rude sheds of shrubs and grass.

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*Bunnoo*

216 Bunnoo is an agricultural country, and is well cultivated and peopled. The khureef is the chief crop, and barley, rice, maize, and wheat are said to be the chief products. Some rice and coarse sugar are exported, some wheat and bajra imported. The villages are very numerous, but small. All the lands are watered from branches of the Koorm, but some of the natives drink from wells. Timber is cheap, being brought down on the river, and the houses are flat roofed. For fuel they burn both wood and dung, straw is cheap, provisions are cheaper than at Peshawur. Bullocks are the chief carriage, cows and buffaloes are kept to an equal value. The turmeric of Bunnoo is exported to all quarters. There are no wastes except on the frontiers of this district.

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*Eesa Khel.*

217 This is a narrow district, but is well cultivated by independent farmers. It is best peopled towards the Koorm, where they water the lands from a cut they have drawn from that river. In the northern quarter towards Kalabagh, the lands are lullm, but have the advantage of khwurs. In neither is it easy to find a well. The natives drink from the

Indus and from canals for irrigation Grain is exported to Kalabagh, and probably other quarters The two crops are perhaps equal, and wheat the chief product They live partly in thatched and partly in flat-roofed houses.

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*Moorwuts*

218. This tribe lives south of Bunnoo, and their country is by some included in Daman, by others not The product seems to be bajra, and most of the lands are lulm Their chief stock seems to be cows, which they pasture in the wastes, in the same manner as many other Afghan tribes pasture their sheep, they themselves while thus occupied, live in tents made of black goats' hair, and generally fenced with shrubs They keep a considerable number of camels, their villages are small.

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*Daman.*

219 This is an agricultural country, notwithstanding its pasturage is so famous, for it is strangers who reap the chief advantage from it On the whole the two crops are equal, in the southern part in which Drabund is situated, the rubbee is the greater, in the northern, in which lie Tuk and Tukwara, the khureef The greatest product is bajra, and after it, wheat and barley Considerable quantities of cotton are raised, and the greater part is exported to the dominions of Moohummud Khan Bajra and jooaree are in general cultivated lulm, but other things are more commonly irrigated The Gomul loses itself in the northern part of the Daman (see paragraph 40) There are also a few dams Many of the natives live by trade There is little fruit save dates, cattle are the chief stock, and their sheep are both of the heavy tailed and light tailed species Camels are the chief carriage, and considerable numbers are bred Some of the mountains, especially that which the Afghans call Kuse Ghur, and others Tukht-i-Sooliman, abound in fir, which afford the neighbourhood timber, fuel, and also torches. The commonest fuel however is from the Guzree, which in certain quarters covers great spaces of uncultivated ground The natives live in flat roofed houses, excepting those who go and come between the lower and upper country for the sake of

trade The villages, with some exceptions, are small, and there are wastes of considerable extent The term Daman is by some applied to a great extent of hills of moderate temperature which lie west of Daman, properly so called, and by that mode of reckoning, the Sheeraness, Oostwanees or Troorianees (as they are more properly called) Doomtanees, and part of the Wuzurees would be considered as inhabitants of the Daman; their country is very waste and ill peopled, but in the winter there is a great resort of the Ghiljies and others, chiefly from Zoormul, for the sake of pasturing their sheep These strangers think they have a right to a pasturage without stint. Those who proceed onwards to the plain and into Mukulwad are compelled by Moohummud Khan to pay a tax for the grass they consume In this hilly part of the Daman the rubbee is the chief crop, and cows and goats the chief stock. They drink from springs and streams, in the plains there are also some wells; the inhabitants of the hills make some use of tents

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*Mukulwad.*

220 Tillage is the chief source of subsistence, and the crops I conceive to be nearly equal Wheat, barley, chunna, and jooaree are the principal things raised. There is little grain exported or imported, most of the lands are lalm, a part of the rubbee being raised on moist lands, which during the rainy season had been covered by the rain, but the quantity of sunk lands is here much less than in the Kuchhee, which is east of the river in Mooltan, or Buhawulpoor. I have formerly mentioned that such lands form a class by themselves, and are called *seo* (see paragraph 166). There is but little good timber within this district itself, yet they have flat roofed houses covered with wood of the date tree, guz, and sheeshum which grow in the country, and some with wood from other quarters. The guz and shrubs are the chief fuel, and are cheap Fodder is moderately cheap, though the hard clay of this district be naturally ill clad with grass, the soil is not the most favourable for many species of grain, but the present desolated condition of the district is chiefly owing to the oppressive government. There are considerable spaces of hard clay

without cultivation or much jungle. In the southern part we find a great deal of thick thorny jungle growing on a good soil. The villages are small. The chief carriage is by camels and asses. Cows and sheep are the chief stock, and in some places buffaloes exceed any other stock.

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*Kuchhee of Moohummud Khan.*

221. This tract has a great deal of seo land, and the rubbee is by far the greatest crop. The villages are of moderate size, some tracts of good land are covered with grass jungle, and some of the houses are thatched. Fodder and fuel are plentiful. Great quantities of turnips are raised, and provisions of most kinds are cheap. The chief carriage is by camels, but the petty trade of the country is carried on asses. The people drink from wells.

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*Thun of Moohummud Khan.*

222. In this tract are kept great numbers of sheep, and pasturage is fully as important as tillage. Where water is moderately near, they raise barley and some wheat by means of wells, but they have no chunna. The khureef crop is much the greatest, and is perhaps all lulm, and comprehends scarcely anything but bajra and moth. The villages are very small and at great distances. The ground is chiefly covered with a jungle of grass and thorny shrubs. The houses are thatched. Grass proper for fodder is very scarce, nor is there any timber, but there is abundance of fuel from shrubs. Camels are the only carriage. Some grain is imported from the Kuchhee.

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*Dera Ghazee Khan.*

223. This is an agricultural district, towards the river are some seo lands on which they cultivate rubbee, especially wheat. On the upper grounds they raise the khureef which is the greater crop, and is partly lulm, partly irrigated. Towards hills the lands are all lulm, except where there are some insignificant streams or dams. The irrigation from jhulars is more common than from wells. Jooaree is the chief crop. The villages are small, and there is a good deal of waste, both hill and plain,

in other circumstances this district much resembles the preceding

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*Dagul*

224 This is a sandy and desert tract, in which bajra is the chief produce, the natives drink from tanks and deep wells.

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*Shikarpoor*

225 Here, as in Dera Ghazee Khan, jooaree is the chief crop. The proportion of irrigated lands is greater, and the jhular is most used, this district being intersected by branches of the Indus, natural or artificial. The khureef is the greater crop, the villages are of considerable size. The cultivation is considerable, but some supplies of grain are drawn from the west and north. In the town the houses are flat-roofed, but in the villages thatch is more common. The town carries on a considerable trade, chiefly with Candahar, and natives of this place, or whose ancestors have been natives of it, reside in the principal towns of these kingdoms, even as far as Bokhara, acting principally as correspondents to houses in Shikarpoor.

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*Seeweestan*

226. This is an agricultural country, and exports grain to Shikarpoor, Kilat, and perhaps some other quarters, but its own population is but inconsiderable. The chief place is Gunduwa, which is reckoned to have 12000 houses, including its villages. There is here a stream called Punjwahee, from which they irrigate their fields. Another small stream is divided equally between Dhadur and Sewee. Those places of Seeweestan, which are situated to the north, have often small streams from the hills of the Afghans, to the north of them; still there is more land than irrigated. There is very little irrigation from wells. A common practice is to make a bank to confine the water, which after rain is collected on the low grounds, and as soon as any place becomes moderately dry, they sow their crops on the moist land. The chief crops are jooaree and moth. There is no sugar raised in this country. Their wheat and barley is but little, and for the most part irrigated. Cotton is raised to a considerable extent.

There are large spaces uncultivated, though it is certain that cultivation by wells would succeed in most of them. The villages are small and defenceless. The houses in general are thatched, and as unsubstantial and cheap as in any part of India. In some quarters those who attend the live stock in their pasturage, shelter themselves under mats. In the winter come down Buloches from the west to pasture their sheep. It is difficult to tell what is the chief stock of this country. The natives live on vegetable food. There is little wood either wild or cultivated, the best supply is from the babool tree. The chief fuel is guz.

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*Shal and Mustoong*

227 These places are about a day's journey distance, and they are commonly coupled together in conversation. Kirta is about eighteen miles west of Dhadur, and has little cultivation. It is the last place in Seeweestan, and from it they reckon thirty-four coss, or fifty miles, to the town of Shal, the intermediate space being uncultivated, and even but little visited by the shepherds. Part of it is the high and cold plain called Dushti-be-daulat, which is a long day's journey broad, and has no water. The temperature of Shal and Mustoong is little warmer than that of Kilat. The only crop is the rubee, which is irrigated from one or more streams. The people generally live in houses, which are flat-roofed. Timber is to be had for their small consumption, and fuel is cheap. The natives subsist by agriculture. They are but few in number. Shal may have 1000 houses, and Mustoong is larger. All the other villages may be equal to Shal. These places are under Mahommud Khan of Kilat, and are in Bulochistan. This country, generally speaking, is included in the ancient geographical division of Khoorasan, but in the present times Bulochistan and Khoorasan are often contra-distinguished. With Shal and Mustoong begin new manners and practices in domestic economy, for here the people make that hard species of cord, known by the name of Kooroot, and which is not made in Seeweestan by the people of Indian race, who are the most numerous of those who dwell there.



### *Report of the Coal Committee*

In submitting a summary of what has been done since our last Report, we shall commence with the

#### *Tenasserim Provinces*

The annexed map will show at how many points coal has been found in the Tenasserim provinces, and at what points it is likely to prove of most utility. Coal has been found by Dr Helfer at A, and B, two situations above the falls of the Great Tenasserim, at a distance of eight and nine days' journey, respectively, from the town of that name, but the quality is inferior, and the situation quite beyond the reach of any mode of conveyance to the coast.

Although the quality is excellent in a third situation in which the mineral has been found by Dr Helfer at C, yet its distance from the coast is such as to render it of very doubtful utility on the Bengal side of the peninsula, whatever benefit it may eventually prove on the Gulph of Siam, as it seems to be situated beyond the boundary range of hills. Fortunately a still more recent discovery by a native, places us in possession of what would seem to be a most excellent coal, close to the banks of the Great Tenasserim river, and within twenty-nine miles of the town of Tenasserim.

Two reports have been addressed to the Commissioner of the Tenasserim provinces on the last mentioned coal, one by Lieut Hutchinson, dated 6th May 1839, and the other, of a somewhat later date, by Dr. Helfer. From Lieut Hutchinson's report, we learn that the position of this coal is  $12^{\circ} 21' 30''$  N lat, and about  $99^{\circ} 5'$  E long, or, by the course of the river, twenty-nine miles from the town of Tenasserim, and sixty-five from Mergui, although its direct distance from the coast is only twenty-eight miles. The coal is said by Lieut Hutchinson to form a thick bed, covered by three feet of "*clay slate*," and from twenty to forty feet of *sand*, which is so tenacious as to require no propping where springs do not exist. In a subsequent correspondence on this subject, the coal is described as within ten feet of the surface, and from all we can learn, we have no doubt it might be worked like crop-coal, and clay ironstone, as described by Mr Farey, i e, merely by sinking pits down to the coal and raising it at once, and after undermining on all sides as much as can be done safely by the use of props, the latter may be withdrawn, and the roof allowed to fall in.

This coal burns with a bright flame, and answers admirably for

steam purposes 50 pounds tried in the still furnace laboratory of the Honorable Company's Dispensary, afforded four gallons of distilled water, and left a residue of four pounds weight of ashes, cinders, and small coal that fell through the bars of the furnace during combustion

Its specific gravity is 1.27

*Composition,*

|                  |       |       |
|------------------|-------|-------|
| Water,           | . . . | 9     |
| Volatile matter, |       | 46    |
| Carbon,          | .     | 40    |
| Ash,             | .. .  | 5     |
|                  |       | <hr/> |
|                  |       | 100   |

The distance of this coal in a direct line from the coast being only twenty-eight miles, Lieut Hutchinson proposed to construct a road, which he supposed would reduce the expense of delivery on the coast considerably. Boats of large draught it is said, may ascend the Tenasserim river at all seasons to Tenasserim town, within twenty-nine miles of the coal, and during the rainy season to the coal itself, so that nothing could be more favourable than the position of this coal for all purposes of local improvement, as well as for steam navigation to the eastward. Forty tons of this coal cost  $5\frac{1}{2}$  annas per maund at Mergui, and 8 annas per maund in Calcutta. The Government have called upon Mr Blundell, the Commissioner of the Tenasserim provinces, to provide 50,000 maunds, and have furnished a working party, consisting of persons accustomed to mining, for the purpose, and have intrusted the superintendence of the necessary operations to Lieutenant Hutchinson.

We have been informed by Captain Lloyd, I N., that about one degree lower down the coast, coal has been found of very good quality on the *Senhea* river, but the Committee have no information on this head, although some progress had been made in raising a quantity, when the work was discontinued in consequence probably of the more favourable position of the coal near Tenasserim. The *Senhea* coal is situated, Capt Lloyd thinks, about  $11^{\circ} 22'$  N lat., and  $99^{\circ} 8'$  E long. about forty miles up the river, the navigation of which is doubtful. It is however the most southern point at which coal has been hitherto found on the Malay coast.

A detached fragment of an inferior coal called Anthracite by some, has been found near Maulmain, latitude  $16^{\circ} 30'$  N thus indicating the presence of coal formations between the Tenasserim coal fields,  $12^{\circ}$  N latitude, and Arracan  $19^{\circ}$  N latitude, and holding out strong inducements to further search being instituted in that quarter.

*Arracan*

The more we know of coal, the more are we impressed with the fact, that it never presents false indications of its presence. There is hardly an instance either in India or elsewhere of its appearing at all, that it does not do so under circumstances to render it in the highest degree important to Society, and although at first the quality and extent of the beds in any new district may be for a time doubtful, yet experience teaches us, that where these indications do not improve in proportion to the intelligence and enterprise directed to their complete development, the mineral is not true coal, but a substance, the peculiarity of which is easily detected, as the brown coal of English geologists. The samples of coal we received from different parts of the Arracan coast, were such as to leave no question whatever as to the beds from which they were taken belonging to the true coal formation.

Coal has been found composing a part of Oogadong, a small island opposite to the harbour of Kyak Phyo, in two situations not very far from each other. The sample supplied was much impregnated with pyrites, it was however a caking coal, belonging to the true coal measures. It would be a desirable object to try how far the Oogadong coal might answer for the reduction of Rambree iron ore, which is very abundant. Red Hill being said to be composed entirely of an ore that was formerly worked to some extent by the Burmese, a small quantity of the ore and coal might be sent to Calcutta for trial, and if the result proved satisfactory, trials on a larger scale might be repeated on the spot, where experiments of the kind must always be cheaper and more satisfactory than when made at a distance. Coal has also been found on Paget, or Adam's Island, south of the great island of Rambree. It has also been found in small seams in one of the Bolonga Islands, as well as near the beach at Sandoway, but the necessary information is wanting to enable us to conclude any thing from these indications, beyond the fact of the existence of coal, to a great extent, in the Arracan provinces.

The most promising bed yet found, is one that was brought to the notice of the Commissioner, Captain Bogle, by Lieut. Lumsden, who states that it was found about two years ago by persons employed in coal-finding by Captain Williams. This coal occurs at a place called Hoong, near the head of a river, which descends from a range of hills on the southern extremity of the island, falling into the Sandoway channel. Mr Lumsden states that large boats may approach to the very spot where the coal is found. On visiting the spot, Mr Lumsden

found "an irregular vein of coal, of about a foot in thickness, mixed with broken red sandstone, and on working below it, he came to a kind of *clay slate* and eventually to water" Mr Lumsden, however, states that he was obliged from fatigue to leave the work to a native, who in a few days brought to him 120 maunds of coal—a larger quantity than we should have supposed a native could procure in so short a time, under circumstances described by Mr Lumsden. A sample of this coal, consisting of four or five maunds, was brought to Calcutta by Captain Bogle, and tried in the Laboratory of the Honorable Company's Dispensary, and found to burn with a clear bright flame and very little smoke. The following are the results of its analysis —

|                    |       |
|--------------------|-------|
| Specific gravity,  | 1 28  |
| Inflammable matter | 40    |
| Carbon,            | 54    |
| Ferruginous ash,   | 6     |
|                    | <hr/> |
|                    | 100   |

It is a free burning coal, giving out a strong heat, and would no doubt be found suitable to steam purposes, as it is quite free from the sulphureous impregnation which rendered the former samples of Arracan coal objectionable.

The want of more satisfactory information than we yet possess regarding Arracan coal is much to be regretted, as there is no part of India in which good coal mines could be attended with more advantage, whether we regard the situation on the coast, or the peculiar circumstances of the province itself. This district is chiefly known to Europeans by the mortality that took place there during the late war. Few are aware that within twenty miles of the town of Arracan, there is a fine elevated chain of mountains, extending parallel to the coast, and affording no doubt as fine a climate as any part of the world, although the coast itself is low, and like many similar tracts in the north of Italy, and south of Europe, unhealthy. Let good coal be once discovered in abundance in this fertile province, and the deadly effect of climate to persons exposed in miserable boats, or damp huts surrounded by swamps, will disappear, and the indolent streams become the track of steamers, perhaps to the very foot of the hills, which might thus become available as places of residence.

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#### *Sylhet*

Although the attention of the Coal Committee has been constantly directed to this quarter, the only result accomplished since the

last report, that can be said to be new, is the delivery of 10,000 maunds of Cherra coal at Goalparah, in Assam, at the rate of eight anas per maund,\* after the attempt to supply that station during the rainy season with coal at any price from Burdwan had failed

Three beds of coal, situated near the foot of the hills, have been brought to notice, but we have no information on the subject to enable us to decide whether these are new discoveries, or merely the bed alluded to in our last reports, as having been brought to notice some twenty-five years ago by Messrs Jones and Stark Without going into that question, we shall merely state all we know of the three beds now alluded to

The first and most promising, is that of Byrung Poonjie,† situated near a village of that name, within about two miles of water carriage, and the ground such as to allow of the construction of a hackery road

We know nothing of the circumstances of the bed, further than is stated by Mr Landers, a practical gentleman, who has been appointed for the superintendence of coal mines in Sylhet and Assam, and who observes—

“ Byrung coal is of a soft quality, intermixed with stones three feet and a half high and varying in its thickness The vein runs from east to west, and descends with the hill towards the south to what extent this field may exist, it is impossible at present to say, the want of proper implements” (these have been since provided) “ prevented me from ascertaining, a trial ought to be made by running galleries into the strata six or eight fathoms, at once to determine both height and quality, and also if it would admit of any outlay ” This coal has been tried, and appears to be likely to answer very well for steam, while it has the additional advantage of yielding excellent coke

Not far distant from the Byrung bed, there is another at a place called Chiela, or Chaila, which varies from one to three feet in thickness This however is said to be an inferior coal

Major Lister, to whom we are indebted for the first and almost the only information we have had regarding the two foregoing coals, states, that Mr. Inglis, of Cuttack, has found a coal bed above Chaila, at a village called Mustuk, about 1,500 or 2,000 feet above the plains,

\* This having been done under the direction of the Marine Board, the Committee have documents on the subject

† Communication has been received from Major Lister since the annexed remarks were written, stating that Mr Landers has traced the Byrung Poonjie bed for two miles to the westward without finding more on an average than a foot of good coal, hence Major Lister and Mr Landers conclude the Byrung bed is not workable

and within such distance of water carriage as to enable a porter to deliver five burdens daily from the pit into boats Mr Inglis is of opinion that this coal is quite as good as that of Cherra,\* and Major Lister observes that it looks so, though the quality is different, being blacker, with an exceedingly high polish, it burns considerably longer than Cherra coal, and cokes less, but is heavier, and yields more ashes

The value of these, as well as similar indications alluded to in our last report, is still doubtful, and must remain so until the whole tract along the base of the Kasyah hills be submitted to a geological survey For the present season, if the Government require coal from this quarter, we agree with Major Lister in thinking it will be necessary to confine our exertions exclusively to the Cherra bed This, as is well known, is situated on the summit of a mountain, nearly 5,000 feet above the sea, and at such a distance from navigable rivers as to render it a day's work for each cooly to deliver a maund, or about 80 pounds, of coal from the pit into a boat

The only way of lessening this inconvenience would be by improving the conveyance, by an improvement of the road Above and below the steepest portion of the descent would admit of bullocks being used, as stated p 48 in our former report Instead of porters for the steeper or middle portion of the journey, it has been proposed to construct a slide, as suggested by the late Colonel Watson The improvement of the road between Cherra and the plains would be a work of some public utility, as it would be the means of facilitating ingress and egress to and from the mountain plateau, it would therefore be a very desirable object, independent of the coal The value of a slide however, would depend entirely on our success in finding as good a coal below, as that which is above—an uncertainty which ought to be at once removed by a perfect geological survey, as already suggested

Some difference of opinion prevails as to the best way of transmitting Sylhet coal to the great lines of inland navigation on the Ganges, some contending that it would be necessary in the first instance to send them a distance of 300 miles to Calcutta, and from thence back to Surda, and other depôts on the Ganges,—experience is the only way of settling questions of this nature, and measures are now in progress for the delivery of the largest possible quantity—10 or 15,000 maunds of Cherra Poonj coal—in Calcutta, with the least

\* A cargo of it having recently arrived in Calcutta it is now (4th May, 1840) under trial on a large scale and promises to turn out very favourably

possible delay, compatible with the fair trial of the experiment. The Kasyahs, on whom the burden of the experiment will literally fall, though a fine athletic race, are little accustomed to labour, Major Lister may therefore have some difficulty at first in reconciling a sufficient number of them to a continued effort, the object and importance of which, they can so little understand.

It is necessary to take the quality of coal into account before any particular price per maund can be regarded as dear or cheap, it is quite incredible to what degree a slight difference in quality affects the value of coal, for steam vessels. It has been found by means of the only trial instituted between Cherra and other coals now in use, that 9 maunds are equal to 14 of Burdwan coal. Let us suppose (without laying too much stress on a single trial of a few maunds) the proportionate value of the two coals to be ascertained as above, 100 maunds of Cherra would not only as a fuel be equal to 155 5 of Burdwan, but we should also have to debit to the latter the value of 55 5 maunds stowage or tonnage, which might amount to more than the entire value of the coal consumed.

The Cherra Poonji coal forms the cap of a hill, from which each cooly may help himself to his load almost without the aid of mining, so that the carriage, 4 annas per maund from the pit to the nearest navigable river, though high, may be said to include the expense of winning, or bringing coal to the surface. Could any of the following indications of coal lower down, towards the foot of the mountain, be found to yield good supplies, a portion, or nearly the whole of this large item of expense might be saved, viz 1 Tipperah hills, in a small river which descends from a hill with a Musulman Doorga called Orpeen, on its summit, 2 Opposite to Jalalgur, in Lowr, 3 Patli river, and several streams descending from the Garrow mountains, 4 Near Susung, 5 On the top of one of the lower ranges at Lowr, and in the rivers of Lowr, 6 In the Dysung and its tributaries, 7 Between Panalik and Bansekora, 8 Barachara, (vide reports of the Coal Committee, pp 49, 50, 51) to which we have now added Byrung Poonjie, Chaila, and Mustuk, (vide para 13, 14, and 15, of the present report.)

The rate of boat-hire from the Sylhet district, along the verge of which the coal formation lies, to Surdah on the Ganges, one of the principal depôts for the supply of steamers, is stated by Mr H Inglis to be 21 rupees per 100 maunds. In regard to water conveyance, Sylhet has the advantage of any of the coal districts to the westward, while its proximity to the great rivers of Bengal gives it an advantage over the Assam coal districts, and thus while

any mines that might be established in Sylhet would hardly be affected in value by similar establishments in any other part of India, there is hardly a district from Arracan to Palamow the value of whose mines would not seriously be affected by any subsequent discovery of coal in Sylhet. In like manner any collieries that might be established in Assam, or other remote provinces, would be entirely superseded in the Bengal market by any new discoveries of good beds of coal that might be made in the Sylhet district. It is for this reason that we have laid peculiar stress on the importance of a thorough investigation of the coal measures along the base of the Kasyah and Garrow hills, since upon this, and the manner in which it is conducted, must depend in some measure the prudence of investing capital in more distant coal districts.

Surdah is within a few miles of Bogwangola, one of the greatest marts in Bengal for grains of every kind, goor, oil, ghee, and the chief articles of native consumption. Being situated in the centre of Bengal, near the junction of all the principal rivers, as the Bhau-garutty, the Ganges, and Bramputra, it is naturally the centre of internal commerce, and consequently the greatest mart for boats in Bengal. Surdah, or some situation in that neighbourhood, appears therefore to be the situation at which a General Depôt ought to be formed. We have consulted J W Grant, Esq of the Civil Service, who had been long commercial resident at Maldah, and Major Carter, who has been for a large portion of his life in the Bengal Commissariat, and the experience of both these gentlemen goes to prove that at Bogwangola and Jellinghee, boats for the transmission of coal from Surdah to any part of Bengal or the Upper Provinces may be had to any amount of tonnage likely to be required.

The distance from Cherra Poonj to Calcutta by water, is about the same as to Surdah, while the latter is one hundred and fifty miles nearer to Rajmehal, and other depôts to the eastward.

Major Carter states that the voyage from Calcutta to Cuttack in an empty boat should not take above 24 days, and returning laden, about the same period, as the stream would be favourable to Dacca, and from thence in the tide way. "Assuming however, two months as the time necessary to complete a voyage, including loading and unloading, it strikes me," says Major Carter, "2½ annas per maund should nearly cover the carriage, and below I give the



|                                |                                           |     |   |   |
|--------------------------------|-------------------------------------------|-----|---|---|
| grounds of my opinion          | A thousand maund boat can be hired at per |     |   |   |
| Mensem                         | ...                                       | 30  | 0 | 0 |
| “ 10 Dandies at 3 Rupees each, | ...                                       | 30  | 0 | 0 |
| 1 Manji at 4 Rupees,           | .                                         | 4   | 0 | 0 |
|                                |                                           | 64  | 0 | 0 |
|                                |                                           |     |   | 2 |
|                                |                                           | 128 | 0 | 0 |

This boat should carry 800 maunds, which just gives 2 annas 6½ pice per maund, so that at this rate Cherra coal ought to be delivered in Calcutta at 7 annas per maund, Major Carter therefore expresses his surprise that an offer recently made by the Marine Board, of 9 annas for Cherra coal, had not been taken up, and suggests that if boats of 2 or 3000 maunds, such as are used for bringing wood from the Sunderbunds, were employed as far as the rivers would admit, the carriage would be still lower

The readiness with which boats may be had for any regular trade, may be imagined by the following observation of Major Carter — “ Hundreds of large boats frequent the Sunderbunds, nearly as far as Dacca, in search of cargoes of rice and dhan, the worth very little more in ordinary years than coal, and the latter scarcely one half as valuable, they do not find their cargoes at one place, or belonging to one person, but attend the banks, and purchase in whatever quantities the people bring to the market, often only a few seers, and seldom exceeding a few maunds ”

The Commissariat regulations, and general custom of paying boat-hire on a computed distance instead of the time actually employed, might in the first instance militate against the economy of any arrangement for hiring boats, says Major Carter, but if a few boats were purchased or built at Dacca or in the Sunderbunds, and manned by a private individual, the result would prove the correctness of these calculations. A good boat could be built for 500 rupees, and in six trips, at the above rate, would yield 300 rupees, leaving 60 for casual repairs, this would repay itself in less than two years, but a boat is expected to last seven or eight

#### *Cuttack*

About ten years ago a specimen of coal found in the Cuttack district was sent to the Asiatic Society, probably with some particulars which do not appear to have been noted in the proceedings, the circumstance was however suggested to the Committee by Captain Jenkins in 1837, and soon after Lieut Kitter, then with his regi-

ment at Cuttack, obtained a specimen, together with some particulars which he communicated to the Committee, on which he was requested to visit the spot, when he collected the following particulars. Half a mile from the Fort of *Talcheer*\* coal seams are exposed along the banks of a small *Nulla* called *Belajooree* (at a spot where workmen employed by Mr G Becher, had a few years before extracted some specimens of coal). Mr Kittoe formed an excavation to the depth of 15 feet, in which he found at a depth of 13 feet a bed of "good glistening coal," 1 foot to 1½ foot thick, reposing beneath ten feet of "*shingle*" and two beds of shale and blue clay, each 1½ foot thick. The latter, as well as a grey rock beneath the coal, both containing fossil plants.

Mr Kittoe states, that a native contractor offered, in the event of coal being raised at Talcheer, to convey it down the Bramenee river to *Himsuagola*, on the coast, where large sloops may anchor, at four annas per maund, but Mr Beetson, the contractor for the transport of salt from thence to Calcutta, was of opinion, that two annas per maund at the utmost would be sufficient. From the coast to Calcutta the transport of coal would be the same as that of salt †

The next coal ‡ which Mr. Kittoe by his guide was conducted, is a few miles higher up the Bramenee, and at a distance of sixteen or eighteen miles from that stream, so that its conveyance would be considerably more expensive. The coal is here exposed for a mile on either side of a nulla called *Sungurra*, a tributary of the Bramenee, averaging in height from five to fifteen feet above the sand. The country is said to be level from the coal to the bank of the Bramenee, so as to afford every facility for the construction of either a road or a canal. Iron ore is found in great abundance throughout both these coal districts, and the ore is smelted to some extent, and by the same process as that which prevails in other parts of India.

Such is the substance of Mr Kittoe's Report ‡. The specimens of coal furnished were not of good quality. Three specimens of Talcheer coal examined at the Mint, afforded the following average results —

|                   |   |   |        |
|-------------------|---|---|--------|
| Specific gravity, | . | . | 1 3610 |
| Volatile matter,  | . | . | 39 0   |
| Carbon,           | . | . | 44 1   |
| Earthy matter,    | . | . | 15 10  |
|                   |   |   | <hr/>  |
|                   |   |   | 100 0  |

\* Talcheer is a town on the Bramenee river, 110 miles from the coast.

† At present there are three contracts for the conveyance of salt from Hunsew to Calcutta, the rates are 18 Rs, 17 Rs 8 annas, and 17 Rs per 100 maunds.

‡ Vide Asiatic Journal of 1839, pp 137—144

Talcheer and Hingolar may be regarded, we think, without much doubt, as an extensive and valuable coal field. The workable beds will probably be found to be some distance from the surface at the spots visited by Mr Kittoe, but the district appears to have been subject to so much local disturbance, that more favorable positions for coal mines may be expected, when the country has been properly examined.

Since the above remarks were written, the Committee have received a communication from Mr Mills, the Commissioner of Cuttack, enclosing a report from Mr Beetson, whom he deputed on 22nd February last, at the instigation of Mr Smith, the President of the Coal Committee, in order to procure further information on the subject. Mr. Beetson reports, that "the samples laid before the Committee by Lieut Kittoe, were far inferior to those I have now brought with me. The latter are equal to the best Burdwan, but to satisfy the Committee as to its description and quality, if Government will pay the expenses, which will amount to a mere trifle, I shall be happy to undertake the delivery of one or two hundred maunds in Calcutta by next December." Mr Mills observes that the specimens, as far as he and other gentlemen at the station are able to judge, are so very good, that he authorized Mr Beetson to procure 100 maunds for trial in Calcutta. This coal is derived from the second, or more distant coal field visited by Mr Kittoe. The locality in which the coal occurs is, according to Mr. Beetson, called *Gopal Pushad*, and the nulla by which it is laid bare, *Sangra*, which corresponds with Mr Kittoe's name *Sungurra*. Mr Beetson states, that the distance from Gopal Pushad to Talcheergur is from fourteen to sixteen miles, and recommends that the coal be carted by buffaloes (the common draught cattle of the country) to Talcheergur. From Talcheer the coal could then be conveyed in ten or twelve maund boats to Kumalung, six miles below Talcheergur, where it should remain till the setting in of the rains, and from thence it may be conveyed for six months of the year in from 100 to 300 maund boats to Hunsuah on the coast, where it would be available for sea-going steamers at from three to four annas per maund. From Hunsuah, Mr Beetson would undertake to convey the coal to Calcutta at 18 Rupees per 100 maunds, and indeed he thinks he could supply it to the Calcutta market at six annas per maund, including every expense.

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*Adjn*

Since our last report, little has been elicited regarding the northern boundary of the Burdwan coal field, where the beds advance

towards the Adjı river Mr Erskine in reply to a circular from the the Committee, dated October, 1838, recapitulates the different places at which coal has been found Mammudpore is the most eastern situation The pits are here four or five miles from Seedporeghat The mineral is better to the westward at Parihorpore, about ten or twelve miles above Seedpore Seedpore is eighteen miles from Cutwa or Culna on the Hooghly, and the river is pretty open during the rains for boats of 400 maunds burden from Maulyghat to Cutwa, a distance of forty miles The upper portion of the river rises and falls suddenly, so as to render it difficult to manage a larger boat than 200 maunds Mr Erskine observes, that considering the difficulty of the Adjı navigation, and the scarcity of boats at present, and also the high price that it would be necessary to offer to boatmen to induce them at first to undertake the carriage of coals, he does not think the coal could be delivered at Cutwa under four annas per maund Should the regularity of the employment induce people to build more boats (as has been the case on the Damooda,) prices might fall to about 3 annas per maund Adjı coals are now used for the Dhoba Sugar Works to the extent of 10 or 15,000 maunds per annum

### *Rajmahal*

When our last report were written, coal was known to exist in two situations only in the Rajmahal hills, namely, Sicrigully and Hurrah In April 1838, Major Forbes was informed by Mr James Pontet that he had found a bed of coal in the Rajmahal hills, on the banks of a nulla called the Bramenee, sixteen miles distant from the water carriage during the rains, about thirty miles west of Moorshedabad, and nearly in the line of the canal proposed by Major Forbes A specimen of this coal afforded the following on analysis —

|                         |       |
|-------------------------|-------|
| Specific gravity, . . . | 1 370 |
| Volatile matter, . . .  | 42 0  |
| Carbon, .. .            | 44 8  |
| Earthy matter, . . .    | 13 2  |
|                         | 100   |

A sample consisting of a few maunds furnished by Mr Pontet sometime before to Mr Scott, the commander of the Jumna steam vessel, also proved of favourable quality Mr Pontet having been desirous of procuring the means of extending his observation, these were provided, and on the 20th June he dispatched ten bags of coal to Calcutta, this also proved favorable, but a subsequent dispatch of 400 maunds consisted of shale and inferior coal. In explanation

of this last unfortunate circumstance, Mr Pontet stated that the necessary aid did not reach him till the rains had set in, when the place being unhealthy, he was obliged to leave the raising and dispatch of the coal to inexperienced natives

The following is an extract from Mr Pontet's letter, in which he describes the operations in which he was engaged—" After the first vein of coal, we came upon a hard black stone, and finding the operation of boring through it so very tedious, I took upon myself to select a spot for a shaft, and procured well-diggers, and stone-cutters, who have been for the last two months at work, at present to all appearance with satisfactory prospects, as one of the stone-cutters who opened a shaft at Burdwan says this mine bears some resemblance to it I am induced to persevere a few feet more, in hopes of coming to a useful vein The first twenty-three feet of soil is red and black earth mixed with kunkur, and under that, to a depth of forty feet, are thirteen different *strata*, three of coal, and the rest various kinds of stone" Mr. Pontet transmitted to the Committee specimens of all the different beds passed through, which are remarkably characteristic of the true coal measures, and of eleven different beds passed through in the last seventeen feet of the excavation, three were coal of good quality, but too thin for working, and in the shale we observed excellent specimens of *Vertabrea Indica*, one of the few abundant fossils of the Burdwan beds that happens to have received a name

The excavation was formed on the N W side of the Bramenee nulla, but Mr Pontet states that he traced the coal a mile S W of the Bramenee river, from which he concludes that the Burdwan and Rajmahal beds are connected

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#### *Soan River*

In a letter from Mr Ravenshaw, Officiating Commissioner of Patna, to the Government of Bengal dated 6th January last, that gentleman states that a Cazee had found a bed of coal at a place called Chupree, four miles from the Soan, near its junction with the Koila, and estimated the expense of delivering coal from this bed to Dinapore to be five and a half annas per maund On this information 300 rupees were advanced to the Cazee to enable him to commence operations, but after extracting 100 maunds, precisely similar to Palamow coal, the bed assumed a slaty character, and the Cazee abandoned his operations If the Cazee's statement regarding the existence of coal so near the Soan be correct, the circumstances under which it occurs ought to be fully investigated

*Palamow*

Mr. Tytler, an engineer employed under the Controller of Steamers, having been deputed, under the authority of the Marine Board, to Palamow, describes a bed of coal six feet thick, exposed to a great extent on the banks of the Amanath river, where Mr Homfray a short time before could only find a  $3\frac{1}{2}$  feet bed, so interrupted by ravines as to render the field very limited. There is however evidence enough in the reports of Major Sage, and Mr Tytler, as well as in the information furnished to Mr Ravenshaw, the Commissioner of Patna, to show that coal is here abundant enough, the only doubt is as to its quality. The samples of Palamow coal that we have seen have been vitiated by the inexperience of the miners with an intermixture of shale, so as to render them unfit for trial. Major Sage, Executive Engineer, Dinapore, states that he had formerly been in the habit of receiving supplies of coal from Palamow, which he considered a good and useful fuel. We have no doubt that a good coal may be procurable in Palamow, but such samples as have been hitherto sent to Calcutta for trial have been inferior, partly no doubt from their having been all chosen from the numerous beds that seem to occur in that district. Major Sage found the following results from comparative experiments instituted between Palamow and Burdwan coal, from which it would appear that the former has the advantage in point of quality

|                  | <i>Palamow</i> |   |    |    | <i>Burdwan</i> |   |  |
|------------------|----------------|---|----|----|----------------|---|--|
| Coke,            | 46             | 2 | .  | .  | 46             | 2 |  |
| Volatile matter, | 47             | 0 | .  | .  | 40             | 0 |  |
| Earthy matter, . | 6              | 8 |    | .. | 13             | 8 |  |
|                  | <hr/>          |   |    |    | <hr/>          |   |  |
|                  | 100            | 0 | .. | .. | 100            | 0 |  |

In experiments of this kind on a small scale, every thing depends on the specimens selected for comparison. The Burdwan coal varies in quality in different mines, just as Palamow coal would vary if mines were once fairly established in that district.

The best Burdwan coal we can induce the contractor who supplies the laboratory of the Honorable Company's Dispensary to furnish, affords 25 per cent of ashes, but the kind used on board steamers is said to be very superior to this, and the Ranyunge variety with which other coals are compared, is the best in Burdwan. Much judgment is therefore necessary in selecting samples for trial from new coal districts, when the object is to compare them with Burdwan coal. What-

ever coal it has been customary to use will always have the advantage of a new coal in such trials, in as much as the form of the furnace, and the manner of keeping up the supply will be such as are suited to the old coal, while the necessary experience is wanting with regard to the most favourable circumstances for burning the new

If the draught of the furnace be too great for the coal, the fire will burn down too rapidly, and the coal will be wasted in an unnecessary quantity, and if not sufficient, the fire will burn too slowly, and the stoker perhaps accustomed to throw in fresh fuel at certain intervals will keep the fire choked, so as to require more frequent stoaking than necessary, and (as Colonel Presgrave remarked on the late trial of Palamow coal) every time the door is opened for this purpose, a volume of cold air enters, the effect of which is to lower the steam

On board the Jumna steamer, 13th March last, three samples of Palamow coal were tried, one furnished to Mr Ravenshaw by Cazee Mohumdee, mixed however with Chupree coal, and the other two from Mr Tytler, the first seemed to answer best, though evidently raised without judgment, and mixed with shale The faults of this compared with the best Burdwan coal were, that it required a much larger quantity to keep up steam, and that it ran into slags or clinkers, which choked the bars of the furnace This last effect may have been owing to the coal being mixed,\* and perhaps would not have taken place had the bars of the furnace been wider apart Mr Tytler's sample from Lower Miral appeared to burn very freely, but compared with the best Burdwan coal, twice the quantity was required to keep up steam On a third sample from Upper Miral being tried, it was found that even with an excessive consumption of the fuel, it could not keep the engine at full work The value of these experiments will however depend on two circumstances, namely, whether the samples tried were the best that could be chosen, and whether the furnaces of the Jumna are as well suited to the nature of the coal as any that could be constructed

Mr Ravenshaw thinks he can procure a contract for the supply of Palamow coal at Dinapore for six annas per maund, it would therefore be of some importance to have the question of its quality fairly set at rest

\* A small quantity of carbonate of lime or soda would have the effect of rendering the earthy parts of coal fusible We think in another trial of Mr Ravenshaw's mixed coal we could easily select the pieces which formed slags from the general mass, as they are covered on the surface with an efflorescence of soda We think they belong to Singra, one of the Palamow beds, and the peculiarity is probably very local

*Assam*

A report having been furnished on the subject of the Assam coal beds since the last general reports of the Committee were written,\* there is little to say on the subject Lieutenant Brodie, principal assistant to the Commissioner, found coal of good quality about a year ago in a very favourable position on the Disung river, a specimen of which was forwarded to the Committee in July last, and found to afford—

|                     |           |
|---------------------|-----------|
| Specific gravity,   | 13        |
| Inflammable matter, | 40        |
| Carbon,             | 55        |
| Earthy matter       | 5         |
|                     | <hr/> 100 |

We believe the Assam Tea Company are already about to open a colliery in this situation, with the intention of keeping a depôt supplied from it at Dikoo Mookh, on the main river

Mr Brodie had before found two and a half feet bed of coal about three and a quarter of a mile above the falls of the Jumna. A boat on average would reach the falls from Gowahattee in twenty days, and return in ten. Some years ago coal was raised by Mr Bruce, under orders of the late Mr Scott, from beds near the banks of the *Suffry*, a tributary of the Disung, on trial *this proved to be the best coal ever found in India*, but the situation was inconvenient, the Suffry being unnavigable at all seasons, and a small ridge of hills would render the formation of a hackery road difficult. In February 1838, Captain Jenkins found two beds of coal, one of them 100 yards in length, and eight feet in thickness, projecting from the banks of the Disung river about a mile above the village of Boorhath, the other situated in rising ground, about a quarter of a mile from the first, was exposed for 200 yards in length, and numerous small springs of petroleum emerged from beneath it. From these Captain Jenkins' servants collected about five seers of petroleum in a few minutes. The Disung is navigable for six months of the year.

Beds of coal were also observed by Captain Jenkins at Jeypoor, about ten miles east of Boorhath, on the Bora Dihing river, a quantity of which was raised by Captain Hannay and sent to Calcutta, but not approved of. Like all similar experiments on the quality of coal the results proved little, especially as we now understand the Assam

\* Published in Journal As. Soc. 1838, pp 948, 959



Tea Company have established a colliery in this situation,\* in addition to the one already alluded to on the Disung, thus two principal dépôts will be supplied on the main river at Debru and Dikoo, from distinct coal districts capable, if necessary, of supplying other dépôts along the whole line of the Bramaputra

An excellent coal was found by Lieut Bigg and Mr Griffith on the Numroop river, in Upper Assam, and Mr Bigg states that immediately opposite the village on the west of the river is another range of hills similar to those in which the coal is found, in these they found eight or ten springs of petroleum

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*Nerbudda*

With regard to the Nerbudda coal, the Committee have received no communications since their last reports were laid before Government, but it appears to have been since tried at Bombay, and found to be of very excellent quality

Specimens of coal were found by Captain Burnes during his mission to Cabul in 1838, in the following districts, viz, 1, Shukur-dura, near Kāla Bagh, where it occurs in a hill two miles south of the village, and other situations in the neighbourhood, distance from the Indus about 15 miles 2, near Muckud, locality doubtful 3, fifteen miles SSE of Cabul near Moozye, in the vicinity of copper mines 4, Jamoo, in the Punjab, near the Chenab, where it would be as valuable as if found on the Indus 5, between Tak on Kaneegoorum, NW of Dera Imael Khan,  $1\frac{1}{2}$  coss East of the small village of Sungarkhyle, in the neighbourhood of the Indus, where the country is said to be poor, and labour cheap Captain Wade, Political Agent at Lodiana, also found specimens of coal in the Maundi Hills north of the Sutlej more recently we believe Mr W Jameson, whose observations will be of peculiar value in every point of view, has found extensive tracts belonging to the coal formation, approaching as near to the Indus as he had been able at the time he wrote to carry his inquiries

(Signed) J M'CLELLAND,

4th April, 1840

*Assistant Surgeon,  
Secretary Coal Committee*

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\* As well another at the place

## *Proceedings of the Asiatic Society*

( *Wednesday Evening, 6th May, 1840* )

The Honorable Sir E RYAN President, in the chair

Read the Proceedings of the last Meeting

The President read the following letter addressed to him by Dr O'SHAUGHNESSY, stating that in consequence of the pressure of other business, he was reluctantly obliged to resign the office of Officiating Secretary to the Institution, and at the same time informed the meeting that Mr SUTHERLAND who undertook to co-operate as Joint-Secretary in the Oriental department during the temporary absence of Mr J PRINSEP also wished to be relieved. He therefore wished to be relieved

TO THE HONORABLE SIR EDWARD RYAN,

*President of the Asiatic Society of Bengal, &c &c*

SIR,—I beg you will have the goodness at the next Meeting of the Asiatic Society to submit my respectful request to be relieved from the duties of acting Secretary. My time is so much occupied by engagements which I cannot neglect, that the general business of the Society must fall into confusion if allowed to remain any longer in my charge. Under such circumstances the best proof I can give of my anxiety for the prosperity of the Society, is by retiring from the honorable office they conferred upon me, at a time when there is fortunately no difficulty in finding at the Presidency individuals qualified in every respect to discharge the duties of the appointment.

Any aid I can afford in the Physical Department, and as a *Collaborateur* in the continuance of the Journal, I am most willing to give, so long as the Society may have the least occasion for my humble assistance.

I have the honor to be, Sir,

Your obedient servant,

W B O'SHAUGHNESSY

Calcutta,  
6th May, 1840

Resolved—That the resignations tendered on behalf of Dr O'SHAUGHNESSY and Mr J C C SUTHERLAND, of the situations of Joint-Officiating Secretaries of the Asiatic Society, be accepted, and that the offer of Mr H TORRENS to undertake the duties of Officiating Secretary, during the illness and absence of Mr JAMES PRINSEP, be cordially agreed to.

Resolved—That the thanks of the Society be given to Dr O'SHAUGHNESSY and Mr J C C SUTHERLAND for their zealous and able services, and for the assistance they have rendered to the Society in the management of its correspondence, in the conduct of the Journal of the Society, and in the promotion of its scientific and literary objects, during the period of their performance of the duty of Secretaries.

Read the Proceedings of the Committee of Papers, in which is noticed the applications received for the office of Curator. The Committee recommend that Mr Assistant Surgeon THOMPSON be selected to officiate in the office.

Resolved—That the recommendation of the Committee be adopted.

Mr J G GRANT brought to the notice of the Committee, that he accidentally had been made aware of the existence of printed Catalogues of the Society's Library, and suggested that the Catalogues and Appendices should be circulated amongst the Members as revised and printed. Mr GRANT's suggestion was adopted.

*Library*

Read letters from Mr Secretary BUSHBY, forwarding the following *books on the part of Government* —

Notes on the Law of Storms, applying to the Tempests of the Indian and Chinese Seas, drawn up for the use of the expedition to China, by H PIDDINGTON

Arabian Nights, in Hindustani, vol 2nd — *From Government*

A Manual of the Political Antiquities of Greece, Historically Considered, from the German of CHARLES FREDERICK HERMANN — *By the Translator*

Answer to a Sketch of the Arguments for Christianity and against Hinduism, by HURROCHUNDER TURKOPUNCHANUN, Calcutta, Feb 1840, in Sanscrit — *By the Author*

Lardner's Cabinet Cyclopædia History of Denmark, Sweden, and Norway — *Purchased in England*

Cyclopædia of Anatomy and Physiology, by R B LODD, 2nd vol — *Purchased*

*Literary*

The following Papers were received from Government, for publication in the Society's Journal

Report on the Country between Tatter, Sehwan and Korachee in Sindh, by Capt DE LA HOSTE, Assistant Quarter-Master General

Memoranda respecting the existence of Copper in the Territory of Lus, near Bela, by ditto ditto

Some Account of a Journey from Korachee to Hinglay, in the Lus Territory, descriptive of the intermediate country, and of the port of Soumeanec By Capt HART, 2nd Grenadiers (Bombay Army)

Dr IRWINE on the Application of Machinery to Indian Agriculture

Read a letter from Capt J JENKINS, Governor General's Agent N W Frontier, requesting the loan of two or three Tibetan works for the use of his interpreter, Mr KELLNER, to make himself fully versed in the Tibetan language

The Secretary informed the Meeting that the subject of inquiry was referred to Mr CSOMA de KOROS, the Librarian of the Society, who reported that all the Tibetan works belonging to the Society were in general on religious subjects, and of which there were several duplicates

Resolved—That the subject be referred to the Committee of Papers

*Physical*

Read a letter from Mr W B TURNER, Chief Engineer on board the "Seaforth" Ceylon Colonial Government Steamer, forwarding a paper on a new mode of making charcoal

Resolved—That the Paper be referred to the Coal Committee

Read a letter from Dr J T Pearson, forwarding a few Geological specimens for transmission to the Museum of the Honorable East India Company

# JOURNAL

OF THE

## ASIATIC SOCIETY.

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*Journal of a Mission from the Supreme Government of India to the Court of Siam —By DR. RICHARDSON.* <sup>1</sup>

*February 10th* —Being Sunday, I had little communication with any one. In the evening Coon-Sit paid us a second visit, accompanied by Radsithee, he is the son of the Pra-Choolia, who is chief of the natives of the Coromandel Coast settled here, and from whom Mr Crawford and Colonel Burney received all the annoyance and opposition in his power; he is descended from the natives of the other side of the Bay, and retains his dress and religion. Mr Hunter called this morning on the Praklang, where he met his brother Pya-si-pi-pat, and some other of the officers who have been ordered to sail with a reinforcement of about 7000 men, (of which Pya-si-pi-pat is the generalissimo) to assist the Rajah of Ligor, against the Malays of Queda. Out of all the royal war vessels, not one was fit to put to sea, being destroyed by white-ants and other causes. They are ordered to start immediately, and are afraid to tell the king the state of the navy; they were consequently at their wits' end for ways and means, besides there being an evident disinclination for the service. The Puttanee people have joined the insurgents, and it is expected they will attack Sangora, which still holds firm its allegiance. The proper heir to the throne of Siam, the late king's eldest legitimate son, who entered the priesthood when

<sup>1</sup> Continued from p 30 vol ix

the present king (who is a natural son) took possession of the throne, hearing that I spoke Burman, sent a message to the Praklang, that he wished to see me, as he also has a knowledge of that language I have not heard whether his request was granted. The king has for some time wished this brother to throw off the yellow garment, and has promised to advance him to high office, but he has vowed, it is said, never to prostrate himself before the king, and does not seem inclined to accept his offer, being in the priesthood, when they meet, the king is obliged to reverence his cloth

Mr Hunter intimated to the Praklang my wish to call on him again to-day, and as they have not made any offer to assist us, it would probably be advisable at once to apply to the Praklang for an order to the South-West chiefs to permit the sale of elephants and cattle, as the season for passing through the country is rapidly wearing away, and especially as a letter had been received by Mr Hunter a day or two previous to my arrival, from George De Castro,\* dated Chumphahoon, the 7th January, to which place he had been sent from Mergui for the purchase of elephants and cattle, which the Myo-won had refused to sell without an order from this government. In the evening, accompanied by Mr Hunter only, I went to the Praklang's, he was waiting for us in the hall in which he previously received us, along with his assistant and several other government officers, my reception was cordial and friendly as before. I took with me a present of two rolls of Brussel carpeting, a pair of pistols, a pair of porcelain essence bottles, and a few articles of cut glass, he said he was much obliged to me for not only coming through the desert I had passed, to make the bands of friendship stronger between the English and the Siamese, but in addition, for bringing presents. I remarked the presents were valuable only as pledges of that friendship, he said true, and that friendship was invaluable. From the white elephant of Maulman,

\* A person sent by the commissioner in the Tenasserim provinces to purchase elephants and cattle on the public account at Chumphahoon, on the Gulf of Siam

and about which they did not display much curiosity, the conversation led to that at Ava, and hence to Ava affairs. Generally from the whole tenor of his remarks, it was impossible not to see that his sentiments were the same as those of his son and Radsithee. After waiting till the subject was nearly exhausted, and he had several opportunities of offering his assistance and co-operation, without having done so, I produced George De Castro's letter, which Mr Hunter, who interpreted, had before explained, and begged he would send an order to Chumphahoon, and all the officers on that frontier, to permit the people to dispose of their cattle without interference, and that I might be furnished with a copy to transmit to Mr De Castro. He said he had already seen that letter, but that as I was daily expected when it was received, he had not yet mentioned it to the king. He made the usual objections on the score of religion to furnishing cattle for slaughter, I said there was no denying that we killed cattle for food, and that we did so without attaching any criminality to it. I mentioned the fact of the Burman army round Rangoon having slaughtered and eaten cattle which we had refrained from killing, that many of the Laos and Siamese people killed bullocks, and that I had never heard any of them refuse to eat beef, that 300 pigs were killed daily at Bangkok, and, moreover, that before we bought the Laos cattle, they were sold to the Red Kareens, who killed and eat them under the name of sacrifices to the Nâts, but that the cattle now required were for the carriage of supplies, and not for slaughter. I also requested an order to the Isoboas of the northern Laos towns not to interfere to prevent their people from selling their surplus cattle, and requested permission to take it up myself, as we wished to make arrangements for an efficient supply of cattle reaching the Provinces by the beginning of May, and that I would return here if the king and ministers wished, that I should remain for a short time, to keep the ministers informed on the true state of affairs between the British Government and the Government of Ava. He inquired on what route I should wish to travel; I said by land, up the banks of the May-Ping, or any route he thought shortest and best. He replied there

was no road that way for elephants ; and Mr. Hunter said, he had seen elephants brought down the river on rafts. I said it was merely my personal dislike to travel in a boat that made me wish to go by land, but that that must not be allowed to interfere with public duty ; if I were obliged to go by water, I should wish to leave the boats as soon as I could proceed by land, and buy elephants for the rest of the journey. He said I might go how I pleased ; that the Isoboas have had orders to allow the people to sell, and had never interfered with their doing so. I said they had never in so many words ordered them not to sell cattle, but he well knew how easy it was to prevent it without such an order ; as difficulties were thrown in the way, and the people were indirectly brought into trouble and fined, who did sell their cattle. He said the Isoboas were only tributary

I asked when I was to have the honor of paying my respects to his Majesty ; he said, he was but minister, and could only say I should have an audience, it remained with his Majesty to fix the day. I have been visited to-day by the Portuguese Consul and his Secretary, by the American Missionaries, and have received presents from his Majesty and the Praklang of fruits, &c

*February 12th.*—Received presents of fruits, &c. from the King and Praklang, and a message from his Majesty to know if we were supplied with every thing we wanted, and whether my people wanted any thing. Benedito, the native Portuguese, the head of the native Christians here, (of whom there are a good many), was the bearer of the message, and said he had orders to call on me daily and attend to my wants. The Chow-fa, the second legitimate son of the late king, a very extraordinary man for a Siamese, has been expressing a strong wish to see me ; he is about thirty years of age, reads and writes English with very great facility, has his house furnished expensively in the English style, and is on terms of intimacy with Mr. Hunter and other English gentlemen here, notwithstanding the strictness of Siamese etiquette. He was nearly coming to see me this evening, in fact he came down to the house and spoke to Mr. Hunter and Captain Browne for an hour or so. I have seen none of the officers of Government to-day, nor shall I before my

audience with the king, which is fixed to take place on the 17th. The Praklang is a great epicure, and withal liberal of his good things; he sends me daily several dishes of what he thinks the best, and is always particularly anxious to know if I eat any; he made very particular inquiries on that head, of Piadadie to-day. It seems to be with him quite as important a matter as any state duty he has to perform, in which he is not particularly interested. Patience is a virtue almost invaluable here.

*February 14th* —Went to the Praklang's garden this morning, in hopes of meeting him, and hastening him in some little matter I was anxious he should settle, but did not see him. Mr Hunter was sent for by him in the evening, to explain a view of London I had brought as a present to the king. I fear I shall have no business done before I obtain an audience of his Majesty. Piadadie called this evening for the king's presents, which I handed over to him.

Some of my Taline followers crossed over to the city to-day in a boat of Mr Hunter's (as no Siamese or Taline dared furnish them with one) to see their relatives, there is a good deal of excitement amongst them, as a belief prevails that I have come to demand their release. The circumstance of the people crossing was reported to the king, who ordered that they should go wherever they pleased, he does not, however, wish me to take any of them to the audience, and they complain that their friends are still prevented coming to them.

*February 15th.*—Mr Hunter saw the Praklang, who had sent Coon-Sit, his son, for my tents, to see them pitched, as he wished to have one made should he be obliged to go against the Malays. I had sent a message to him in the morning by Benedito to say my Taline people were very anxious to see the king, and as they were not subjects of Ava but England, I wished he would get permission for them to do so. He told Mr. Hunter I was to be received with higher honors than he had ever witnessed at Siam, and that they could not be admitted this time, but should I afterwards have a more private audience, they should then be allowed to accompany me. He also told him letters had arrived for me at Camboorie, but that the Myo-won was afraid to allow the messenger (who would not give up



the letters) to come on, without orders, the Praklang had immediately dispatched an order that he should be forwarded forthwith. I doubt there is little chance of their arrival here in less than a week.

*February 16th*—Benedito visited me to-day to make arrangements for the audience. Mr Hunter had, however, settled all these matters with the Praklang. In the evening I heard prince Chow-fa, who will probably succeed to the throne, was going on board the whale ship *Hamilton*, and as I knew he wished to see me, but did not wish openly to come here till after the audience, I went on board just before dark, and soon after it was dark he came on board. He was in a small boat, and only four or five men with him, dressed, as all ranks usually are, with a cloth and crape scarf round his loins, he is a stout dark man, about 30, with a good tempered appearance, of which he has the character, laughs heartily, and speaks English with very tolerable proficiency, he is intimate with Captain Browne and Mr Hunter, shook hands with me on coming on board, and said, “oh, oh, I should not have seen you, till you had seen the king.” I told him I had heard much of him, and was very anxious to see him, but this meeting was of course quite accidental. He remained about an hour talking familiarly with us all, he expressed a wish to see the map I had of Ava, and the North of Siam, and talked of my route and observations. He is himself an excellent observer, and much attached to the English and English manners and habits.

*February 17th.*—This being the day appointed for my audience with his Majesty, about half-past nine, Benedito, who was to accompany us from the house, reported the boats ready to take us over the river, and at 10, we started, Mr Hunter and myself in one boat, such as is used by the ministers, Captain Browne, of the whale ship *Hamilton*, Mr. Smith, and Mr Hayes, gentlemen belonging to Mr Hunter’s establishment, and an officer of Captain Browne’s ship in a second boat, like a Burman pounge; and my followers in a third. In a few minutes we crossed the river, and passing up beyond the landing place used by the king, landed near some large sheds, where we found Piadach<sup>o</sup>, and several other native Christians, officers of the

Siamese army, dressed in their embroidered uniforms, with gold epaulets, &c waiting to receive us Benedito had a spare cocked hat, with tawdry embroidery and some rubies of small value, stuck about it, carried before him on a thing like a barber's wig block Mr Hunter and myself had brought with us two hammocks furnished us by his Excellency the Praklang, in which I was carried by eight of my own bearers, and Mr Hunter by four of his own servants We had here to wait several minutes for the horses which were provided for the other gentlemen, they at length arrived, and we moved forward, preceded by Benedito, Piadadie, and others Though within a few paces of the southern entrance of the palace, we were as usual not allowed to enter there, but carried round through one or two small streets by another gate, further from the palace Outside the inner gate the native Christians took off their shoes and stockings, and immediately within it we got out of our hammocks, and walked through two lines of soldiers, who on this occasion were all standing up, some with shouldered arms, some at ease, some muskets on one shoulder, some on the other Though there are said to be an immense number of muskets in the country, many of those used to-day were so covered with rust as to be useless The men were all dressed in a sort of uniform jacket, or red shirt, with a conical red cap of varnished basket work Some, I suppose the native Christian artillery-men, were dressed in better jackets, and blue cloth caps, with a little yellow embroidery They generally were I think under sized, decidedly inferior in point of muscularity to the Burmans, and some of them mere boys There was a formidable body of what the Burmese call "dank yea," brave "sticks," armed with clubs, any one of whom is said to be able to keep off two Siamese swordsmen ; there was also a body of spearmen, and close to the door of the palace the band, composed chiefly of drums, trumpets of various kinds, and hunter's horns Outside the first enclosure there was a small body of cavalry, perhaps fifty horses, and inside the second enclosure, close to the road, fifteen elephants, each with two riders besides the mahout, all dressed in red cotton velvet jackets, some were plain, some embroidered, with caps to correspond A short way from the palace door we

were shown into the Praklang's hall of justice, in which a carpet was spread, and a seat prepared for us; here, with Benedito and some other of the Portuguese officers, we were detained for forty-five minutes, till the princes were assembled. The people were perfectly civil, and with a little mild persuasion of the rattan, tolerably quiet. My people came with me to this hall, and followed me to the door of the palace, where they might have remained quietly, had not some of them attempted to come into the hall, they were in consequence conducted back to the hall where we had halted, outside the gilt door of the palace, which was closed. The Siamese and native Christians who accompanied us fell on their knees and made as many prostrations as they could, for a minute or less, while the door was opening. We walked in, taking off our hats at the door, Benedito creeping in before me on his knees and elbows, and some of the others crawling near us. Immediately inside the door, is a gilded screen, near which the people were lying so close that only one could pass at a time, after passing it we came in sight of the king, beyond this we advanced a few paces, and sat down on the carpet (which covered the whole centre of the hall) in the place pointed out to us, making two or three salams to his Majesty, after which he called us to come nearer, myself and Mr Hunter then went in advance of the presents I had brought, and the other gentlemen close up behind. At one side, and immediately in front of us, was Pia-pil-pat, the second Praklang, who was the channel of communication with his Majesty. The Pya read a list of the presents, commencing and ending with a long list of his Majesty's titles, after which, the king at intervals put the usual questions, and as Piadadie (the interpreter) who met us when we landed, had been taken ill and obliged to go home, Mr Hunter was requested to act as interpreter, and spoke sometimes in the Portuguese of this country to Pascal, and sometimes in Siamese to Radsithee. The king asked if it was the same Governor General who had sent Colonel Burney, who now ruled India; how long the present Governor General had had his sway there, asked after the Queen, the Right Honorable the Governor General and the Com-

missioner's health, how long I had been on the road, how treated, &c &c Near the end of the audience, he inquired on what terms we were with the Burmans, I detailed fully the state of our relations with Ava. He said, the Siamese had always been the foes of the Burmans, who are never to be trusted, the Cochín-Chinese are also of the same character, for though he had been a benefactor to the present king's father, they had gone to war with him, but with the Chinese they had always been friends from the beginning of time, and hoped they should be friends, through all time coming, with the English. I took the opportunity of saying, that the Right Honorable the Governor General would be happy to hear how entirely his Majesty's wishes for increasing friendship and intercourse between the two countries coincided with his own. He said he was much obliged to the Governor of Bengal for the present Mission From the knowledge I have of the Laos language, and its affinity to the Siamese, I could make out that my answers to the king's questions were modified to meet the royal ear. Mr Hunter, however, told me that the entire substance of what I had said was communicated. At the end of the audience his Majesty said, if I had any business to transact, the Chowkoon-booden and Chowkoon-maha-see-na (the Praklang) would attend to it, and that any wish of the Governor of Bengal was the same as if it were his own He requested Mr Hunter (whom they consider as a Siamese officer) to pay me every attention, and let me want nothing that was to be had in Siam, he then gave a few strokes with a ratan on some metallic substance, and the gold cloth was drawn across the hall before the throne, the courtiers all made repeated obeisances, and the audience closed. We remained a few minutes after the king had retired Coon-Sit came over to us and introduced me to Chowkoon-booden, who said he should be glad to see me, and hear every thing I had to say The hall of audience is about 120 feet long, and 60 broad, with two unsightly rows of square brick pillars, about 15 feet from the wall; and between these pillars there is a space of about 45 or 50 feet covered with carpets, close to the curtain, a little to the left of the throne,

with their heads towards the king, crouched upon their elbows, were the princes of the blood, perhaps 20 or 30 in number, immediately behind them, the Chow-pya Piaklang (who is also Kalahon, a higher office than Praklang, in virtue of which he controls the affairs of one half of the kingdom towards the west and south), beside, and behind him were a number of the highest officers, inferior to him, on the right of the king, in a line with the Praklang, Chowkoon-booden, the prime minister, (who rules the eastern and northern half of the kingdom) was crouched, with officers the same as the Praklang near him. The whole of the rest of the hall was crowded with officers of less note, except a space of 10 or 12 feet wide right down the centre, where we were seated, about one-third of the way up to the hall, the presents immediately behind us, Piatschadook Pia-pi-pat, the Praklang's deputy, and Pia-Choolia, the chief of the natives of the Coromandel Coast, immediately in front of us, Mr. Hunter on my right, and Radsithee close to him. The king, who was seated on his highest throne, on which Mr. Hunter had never before seen him, addressed Pia-pi-pat, who repeated the questions to Radsithee, he again to Mr. Hunter, who communicated them to me. The hall is painted to resemble paper, with a paltry looking glass above, and a miserable print between each window. The courtiers were all dressed in their robes of ceremony, muslin with flowers of gold, and heavy gold embroidery on each arm, the six first on each side of the hall had, besides these, a gold betel apparatus, diminishing a little in size from those of Chow-pya-koon-booden and the Praklang, which were in size and shape like an old fashioned soup tureen, those behind them had the same apparatus, and some of less costly materials. The throne was raised about 15 feet from the floor, apparently all of gold, in shape something like a boat, with four pillars and a small canopy, all of the same metal, close to the feet of it was a child about 11 years old, I believe the youngest son of the king, near him was a musical clock, which was sent out a present to the emperor of China from England, with Lord Amherst, and was bought for the king by Mr. Hunter.—On the whole, my reception (as I was frequently told it would be) was one of

more state and ceremony, and of longer and more friendly nature as regards the time of its continuance, (lasting one hour and 20 minutes) and number of questions put, than has been granted to any Mission for many years, which I presume may be attributed to the more just idea they now have of the power and resources of the British Government. The conquest of Ava, and the long retention of the provinces, are however the only data on which they form their estimate, in addition to the personal character of Mr Hunter, who, in a residence of 14 or 15 years, at first under very trying circumstances, has, by honorable dealings and a proper degree of self-respect, obtained for himself great influence with the king and officers of Government, and (by the influential people to whom he has familiar access) a nearer approach, as far as their ignorance and arrogance would permit them, to a more just appreciation of our relative rank in the scale of nations. On leaving the hall we visited one or two of the richest Kyoungs, or convents for the priests, the gilding and gold ornaments of some of which were solid and expensive, one of the chandeliers, of which there were many suspended from the high roofs of the building, was pointed out to me as having cost 100*l.* in London. In the same Kyoung is the famous image, said by the Siamese to be one entire emerald, of about 18 inches or two feet high, which was pronounced by Mr. Finlayson to be either Chinese figure-stone or a pelotrope, but as it is raised on a pyramidal pedestal (richly gilt and inlaid with gold) of about 16 or 20 feet high, it is difficult to say what it is. The whole of the outside of the building is also gilt, and inlaid with stained glass, and the appearance is altogether rich and unique, round the edifice are a number of grotesque figures of fabulous animals. From this we visited a second, somewhat inferior to the first. My Burman followers have remarked, that there is not a pagoda or priest's house, that they can hear of, in Bangkok, that has not been built by the king, or some of the very highest officers of the kingdom, who, as they remark, can oblige the poor people to do the work, whilst they take the credit, and there is no doubt, that though the Siamese do not perhaps extort money from the lower orders in the way the Burmans do, they exact so much more personal

service from them, as they have no time to acquire any by extortion. We were then taken to see the large guns, one of which, in particular, a brass one, was cast by the nobles, the king superintending. The mould was placed upright, and surrounded by stairs on all sides, the princes and great officers were all seated round with bellows and smelting pots, when the metal was ready, at a signal given by the king they all ran up the steps with their pots, and poured the contents into the mould. This gun is probably not less than seventeen or eighteen feet long, and the bore about six and a half inches in diameter. There were a great number of good iron guns of different calibers, piled up in sheds, in various parts of the palace enclosure, and a good many others mounted in a shed near the wall. We then visited the white elephant, one male now only remaining of the five which were here at the time of Mr Crawford's Mission, he is a large handsome animal, much like the one in Ava, excepting that from vice he has broken off both his tusks nearly close to the jaw. They made some inquiries about the one in Maulman, which is very much darker than this, though said to be an Isadan. From the elephant-shed, which is close to the river, outside the palace enclosure, we embarked in the boats which had come round for us, and returned home. In the evening the Piaklang sent for Mr Hunter to inquire how I was pleased with my reception, who told him that I was highly pleased with every thing.

*February 18th.*—To-day I returned the visit of the Portuguese Consul, Mr. Marcelleeno. In the evening Coon-Sit called on his way to the palace, where he and a number of others, who are honored with the title of "ma-lik," or little dogs, nightly attend from about 9 or 10 o'clock till 1 in the morning, when all the news of the city is talked over; sometimes they are detained even later. He asked me how I sat in the presence of, and how I addressed, the king of Ava, I told him, I sat as I had done yesterday at the palace, and addressed the king as familiarly as I did him now, he confessed it was better than the way they were obliged to lie here like dogs. There has been an absurd story current in the town to-day of an attempt I wished to make on the king's life, it was said, I had brought three boxes as presents,

two of which I opened and shewed the contents, but the third I had refused to open except in the presence of his Majesty alone, who had, however, with great sagacity, discovered it to be filled with some explosive materials, and gave orders that it should not be admitted into the palace. Absurd as this story may appear, it was firmly believed by a number of people. Scarcely any thing is too ridiculous to gain credit, even with the highest officer. Some Siamese had been in Maulmain last year when the European Regiment was landing there, and on their return, reported to the Praklang that an immense force of Europeans in fifty ships were at Maulmain, destined to attack Siam, he immediately sent for Mr. Hunter and questioned him about it, who used all the reasoning he could to convince him of the falsehood of the report, he at last told him, which at all events prevented them from saying any thing more about it, that the English would certainly not collect fifty ships to take Siam, as two would be quite sufficient; he heard no more of the intended invasion.

*February 19th*—About three o'clock this afternoon Benedetto and Pascal came to conduct us to the house of Chowkoonbooden. Josis Piadadie continues sick, and Mr. Hunter was kind enough to act as interpreter, Captain Browne and Mr. Smith accompanied us. After about half an hour's detention, (attended by the Portuguese above mentioned and Radsithee) whilst coffee and sweetmeats were served in a small shed 10 feet by 20, outside the enclosure of his present habitation, where a band of dancing women (he and Cromaluang-rak, the king's uncle, and the head of the princes only are allowed to have dancing women) exhibited for our amusement,—we were conducted into the hall, where we found him seated on an elevated platform, the second Praklang and several Siamese officers on one side, and some 20 or 30 Laos chiefs on the other. Chairs and the Praklang's coffee equipage were placed for us on the same side as the Siamese chiefs. After I had expressed the thanks of the Right Honorable the Governor General in the terms of Mr. Prinsep's letter, and of Mr. Blundell, as conveyed in his letter to the ministers, nearly an hour was spent in compliments and general professions of friendship for



the English ; and in return, I assured him of the deep interest the Right Honorable the Governor General and high officers in India had in the welfare of Siam, and their sincere wish for the continuance of the very friendly relations at present existing between the two countries I said I was much obliged to the king for the honor of an early audience, and that I could not forget his friendly assurance, that the ministers would attend to any thing I had to say, and that any wish of the Right Honorable the Governor General was the same as if it were his own He replied, that when the king was so friendly, the ministers must of course be equally so.

We remained until half-past six with this minister, discussing various points of business His Excellency inquired if I wished to take certain orders to Laos myself, and whether I intended returning from thence to Bangkok, I replied I wished to be the bearer of the order to Zimmay, but that my return here depended on the wishes of the king He replied we were good friends, and I might take the order and return by any way I pleased; if I wished to return here, I might do so I thanked him for the permission to proceed to Zimmay After leaving the minister's house we went to the palace of Chow-fa-noi, which is a short way above our residence, on the right bank of the river It was built by Pya-tack, the Chinese king, who re-established the monarchy, and built a new town here, on the site of the old French factory, after the old city of Yodea had been taken, and the royal family carried off by the Burmese. It is a brick building, and stands in a small fort close to the river, on the angle formed by the junction of the Maha-tchi canal, it was full of pointed gables and cross roofs, like an old farm house in England; it covers a great extent of ground, and has an immense number of apartments and passages, some covered, some open. In the morning, as he was going down the river to get up a mast in one of Pya-pi-pat's war junks, he called at the factory, and requested me, if I intended calling on him to-day, to come about 7 P M. It was just seven when we arrived at his house, and in ten minutes he came home He is the second legitimate son of the late king, and will probably

succeed his half brother, the present king. He is intimate with Mr Hunter and Captain Browne, the latter has instructed him in observing and finding the longitude, in which he was a very apt scholar, he is easily accessible to all English frequenting the port, and much attached to us. The room we were received in was fitted in the English style, and on the table was a splendid gilded lamp with cut-glass shades, which was made for William the Fourth, the walls were decorated with English prints, and he had a small library of English books, of which the *Encyclopedia Britannica* formed a part. He was kind and cordial in his reception, and familiar in his conversation with us all. Our entertainment consisted of a light supper, coffee, and sweetmeats, after which he went to look at his band in an ante-room, it consisted of twelve or fourteen musicians. Several of the instruments were of his own invention. He moved freely about the room, in which we followed his example. He introduced us to his wife, who is a tall fine woman of Taline descent, of unusually pleasing manners for a Siamese. He had his little son, who was asleep, brought out to us, I have seldom seen a finer child, he is about five months old, and was dressed in a red English frock and blue cap, with a gold band round it, he had been inoculated four or five days ago by Dr Bradley, and the disease promised to be favorable. The small-pox is raging here with fatal violence, it is treated by the natives by repeated bathing or rather effusion of cold water five or six times a day from the commencement of the pyrexia. Chow-fa-noi also shewed us his jewels, which must be of considerable value, there were three broad gold belts studded with diamonds, the smallest of which, by rough calculation, contained 1300, many of them large and valuable, a box containing thirty-five rings, many of them diamonds of considerable value; he had only one or two rubies, and those inferior ones, the jewels were strewed about the table in perfect confidence. His reception of us was frank and cordial. His servants, to one or two of whom he speaks in English, and in which language they are obliged to answer, stand up and move about his house with freedom. There were none of the nobles of the land present. We took our leave about 10½ o'clock.

*February 20th* —I proposed, through Mr. Hunter, to meet the Praklang and Chowkoon-booden together, as each appeared to have a separate jurisdiction, and could not give an order on my business without reference to the other. There was no objection made to my proposition. The Praklang suggested that I ought to visit Cromaluang-rak, the king's uncle, the head prince, who would be prepared to see me on Friday, in the meantime, I should have received my letters from Maulmain. I am most anxious to get on a more intimate footing with the ministers, but fear I cannot succeed before all the visits of ceremony are got over. Old Benedito called in the afternoon, and told me privately he had no doubt all my wishes would be complied with; he is however an insignificant old gossip. Coon-Sit came also in the morning.

• *February 22nd* —Called to-day, at 4 P M, on Cromaluang-rak, whose house is to the south of the palace enclosure, about five minutes walk from the bank of the river. On the way we crossed a new Nât, building by the king, the pagodahs, Kyoung's temple, rocks and small trees, (of which, much is in the Chinese style,) may cover ten or twelve acres. Between the walls of the palace and the house of the prince is the race-course, where the horses are exercised, of which there were perhaps twenty gallopping about for our amusement; there were also a small Arab and Cutch horse in gilded saddles paraded, with about fifteen or twenty elephants. Though this is the country of elephants, I did not see one good looking animal, some of them were large, and one with very large tusks we had seen before in the palace. The horses are inferior to the elephants, and apparently for no other purpose than to look at. Here we were detained about twenty minutes, outside the prince's gate, in an open shed, the native Christians, Benedito and Pascal, the Praklang's son, and some Siamese officers whom I did not know, were also present. The prince's house is sadly out of repair, and he is about building a new one. The hall in which he received us, was a low room about forty feet long by twenty-five broad, nothing at all rich or showy about it, except a curtain cloth of gold. He was seated on a sort of low pedestal, like the thrones of the Laos Isobaos, and a white umbrella behind him.

A large concourse of people were collected outside ; on interrogating some of them, they said they had come to see the (Kek Moun'g's) visitors. There might be about 100 people, princes and others, in the hall. He asked nearly the same questions as the king, to which the same answers were returned. I complained of the detention of my letters, and said the Mya-won of Camboorie should be reprimanded for stopping them contrary to the custom of all civilized countries. The prince appeared affable and good tempered, but Mr Hunter, who sees him frequently, says he was distant and constrained, evidently at a loss what to say. The visit lasted about an hour, (the round-about questions and answers occupying nearly all the time) when we were asked to go into a large hall outside, where a table was spread and refreshments offered us and fruit, sweetmeats, the Parklang's coffee-set were again in requisition, here we remained perhaps half an hour, and then returned home. The visit was altogether one of ceremony, no one spoke but the prince and myself. Mr. Hunter again kindly accompanied me.

*February 24th.*—Yesterday received dispatches from Mr Blundell. I saw the Praklang to-day, and pushed for the delivery of the Thugs, as they are in his division of the kingdom, and said, I would write with them to Captain Macfarquhai, who would pay the person on delivery, and sent in charge of them, fifteen rupees each, to defray any expence the Siamese government might have been at on their account, he said they should be given up, and remarked that they paid three catties (160 ticals), for each man so delivered, and asked me to give up six Cochim-Chinese, who had escaped to Maulmain. I said that as I did not know their crime, I could not promise their being given up, but that if he could furnish me with a copy of the evidence against them and their sentence, I would forward it to the Commissioner, and in the mean time tell him whether I thought it likely they could be given up, if they were only run-away prisoners, it would be unreasonable to expect them, several of our people came here voluntarily, we did not dream of demanding them ; he said if I examined their backs, I would see the marks of the ratan, I told him they might have been punished for faults which was in some sort an

expiation, but certainly did not render them criminals for life, their case was, I believed, very different from the Thugs, who, for murder of the most cold-blooded character, were condemned to imprisonment for life. The subject was then dropped. I introduced that of the Chinese caravan, and requested him to give orders to the Zimmay chief not to prevent them from coming on to Maulmain, he said he had sent for the Zimmay Chow-Hona, and in presence of Mr. Hunter had given him positive instructions on that head, and he had assured him, the Chinese had never been interfered with, but that finding the market at Maulmain did not suit their goods, had, of their own accord, declined going there. I mentioned the facts of the case, which were, that the Chinese from the first had expressed an earnest wish to trade directly with us, and in spite of the lateness of the season, several of them had come to Maulmain, (sent by the head man of the caravan) after my first meeting them in Laos, and so satisfied were they with the market, that a large party had last year come to Zimmay, where they had been prevented proceeding by the Chow-Hona of that place, many of the goods intended for Maulmain not suiting the Laos market, they were obliged to take back with them, or dispose of at a considerable loss.

It was now half-past eleven, and the old gentleman intimated that it was time to go to the palace. I pressed him to settle these matters as soon as possible, as the season was wearing away, and I wished to start for Laos in a few days, he said I should go any way I pleased, if I wanted boats, he would furnish them, if I wanted to go by land, I could do so, and that I should not be detained longer than necessary. The old gentleman was exceedingly affable, friendly, and good tempered throughout the whole discussion. We took our leave, and he immediately got into his boat to go to the palace.

*February 28th.*—In the morning I went to the camp (so called) of the native Christians, who live about a mile above the town. In going there, we went down the river a few hundred yards, and entered a small branch which forms the island on which the town is built, it is not more than perhaps 120 feet wide, houses are built close down to the water on both banks, and the stream, except in the centre, crowded

with floating houses and boats, several other small branches or canals run at right angles from this through the town, the walls of which are of brick, about eighteen feet thick, and perhaps twenty or twenty-five feet high, following the slight sinuosities close along the banks of the stream, but could only be seen occasionally from the crowded state of the houses on the banks. There is at each angle of the walls a projecting sort of bastion with a double wall, and a turret of flimsy construction, and the whole works seem exceedingly contemptible, the passage of this branch, which surrounds a little more than one-half of the town, occupied about forty minutes, and about twenty more from this to the Christian location. Every thing about them, except the houses of the chiefs, Benedito and Pascal, was mean, dirty, and disgusting, beyond any thing I have seen in this part of the world, and the character of the inhabitants is said to correspond, we visited also the priests, both of them Frenchmen, who are highly respectable men in their station. The bishop is just now absent at Singapore. Besides the descendants of Portuguese, who amount at this station, which is called the Cambodea Camp, to 700, there are 1400 Cochin-Chinese Roman Catholics who fled from that country, being persecuted on account of their religion, about four years ago. Though the hovels they live in are miserably small and dirty, yet they are said to be tolerably contented, and find it easier to obtain a livelihood here than in Cochin-China, where they say there are hundreds of families who never knew what it was to be possessed of one coin of the smallest denomination, they chiefly occupy themselves, I believe, in fishing, though many of them, beg about the town. We remained at Pravie-tsets (Benedito) about two hours, and returned home by the main river. Visited the Praklang after dinner. When we arrived at his house, we found the second Praklang and other officers there as before, there was a good deal of conversation regarding Bir-mah and England, on which last subject the Praklang, from his intimacy with Mr. Hunter, is better informed than people on this side of the Ganges generally are, though I am certain he does not believe what he has been told of the extent and number of our colonies, the tonnage of our shipping, &c.

On matters of business little was done With reference to my returning here, he observed I might do as I pleased ; to tell me not to come back, would not be friendly, and to tell me to do so would not be proper. I complained again of the detention of my letters, contrary to the custom of civilized countries, at Camboorie ; he excused the act on the ground that the customs of the Siamese and English differed ; the Mya-won dared not allow them to come on without reporting it to the ministers I said I had no wish to infringe any of their customs, but requested that whilst I was here, as they knew the people with letters having a pass from the Commissioner of Tenasserim must be coming to me, and that the letters were for the information of the ministers, that he would give orders that they should not again be stopped.

*March 1st* —A dispatch arrived last night from the Governor of Songora, reporting that the Malays were within two miles of that place with 3000 men, and begging immediate assistance The Rajah of Ligore though he promised on his departure from this immediately to recover Queda and put a stop to all the disturbance on the peninsula, has not yet left Ligore, and as even Siamese report gives him no more than three thousand men, the truth probably is, he has not half that number yet assembled

*March 2nd.*—Radsithee and Coon-Sit called this evening

*March 4th.*—The Praklang sent to tell me that the Taungthoos I left at Neamgben are at Camboorie, and wished to know whether I intended them to come on here ; I told Piadadie to tell him they were merchants, and ought never to have been stopped, and begged they might be allowed immediately to come on if they wished it, as this is a direct infringement of the treaty. I hope I shall now be able to put an end quietly to these absurd stoppages of our people at Camboorie on my next visit.

*March 6th.*—Sent to the Praklang to beg he would allow me to see him for a few minutes to enable me to answer my letters and dispatch the messengers to Maulmain, who have now been most unexpectedly, and much to my annoyance, detained eleven days As this was the day till which I was requested to wait, on my last message to him, I was much disappointed about four

o'clock to get a message from him by an old Portuguese begging me to give him to-day and to-morrow, that the preparation and embarkation of the troops for the Malay expedition had fully occupied all his time. I fear I shall still be disappointed, and obliged to close my letters without any positive information on certain points on which I depend for answers from this most dilatory government, it will take a month to reach Zimmay from this, and from thence it is twenty-three days more to Maulman, which will bring it to the middle of May, (supposing I even start on the 10th of this month, which is the earliest I can possibly expect, and have no detention in Laos,) before I can possibly reach Maulman.

*March 7th* —The force for the reinforcement of the Rajah of Ligore having dropped up with the tide last night for his Majesty's inspection, sailed down again to-day, after firing a salute of a few guns, and is considered as having started, though they will not finally leave for two or three days. The first part of it which I saw passed down about 12 o'clock, it consisted of twelve war boats, two large and three small junks. The largest, a very fine vessel which the Rajah of Ligore was six years in building, and which he presented sometime ago to the king, was commanded by the commander-in-chief, Pra-si-pi-pat, the Praklang's brother, it was very gaily decked with red flags and streamers, and himself habited in a red dress, with a good deal of embroidery, looking at the distance from which I saw it, much like the war dress of the Burman chiefs, on his head he had a broad brimmed beaver hat, with a sort of gilt spire attached to the top of it, he had a splendid gilt cabin erected above the taffrail, and a chatta bearer with a large red chatta shading him from the sun. The smaller boats were towing his junk, and pulled by the soldiers, all of whom were dressed in red jackets, or shirts, and white trowsers. There might be perhaps 1,500 or 2,000 men in this part of the fleet, and one or two junks sailed down afterwards with perhaps 500 or 1,000 more, called by the government 5,000.

There is a deficiency of transports, though the king has borrowed every junk he could get hold of, many of which will probably never be restored again, as the people put in



command on such occasions sometimes sell them or run off to the eastward, instead of bringing them back to Bangkok. The troops with their new red jackets certainly looked tolerably formidable, though more in appearance than reality, many of them never having fired a musket in their lives, and it is also the general's own débüt in a military capacity. It is said, I know not with what truth, that a little jealousy on the part of the king (to whom he is related) obtained him the high distinction. A few months ago, his son and eight others (four women, amongst whom was the guilty fair one, and four men) were beheaded for an intrigue with one of the palace ladies, and for causing an image of the king to be made and running a javelin through its heart to cause him to turn away this woman. They were tried by the fathers of the two culprits, condemned, and beheaded. It is said, the king wished to spare them, and asked their fathers to be security for their future good conduct, but fearing the king might think they supposed the punishment undeserved, or some other motive equally Siamese, or slavish, they refused. It is said, the king supposes Pra-si-pi-pat to be discontented, and hopes the Malays will give a good account of him, as the commander-in-chief, however, he chooses his own position, and as putting himself voluntarily where there was a chance of danger would be viewed as utter folly, he will probably return. I should think, however, the king has little reason to fear him, and I doubt if there be any ground for the report. As the Praklang's anxiety about the equipment of the troops is now at an end, I sent to him this evening (Mr. Hunter was kind enough to go), and begged, I might now have the boats to dispatch the messengers, he promised that I should have them to-morrow, and wanted to know why I was in such a hurry!! I yesterday sent one of my people overland to Nak-outcha-thee to look at the elephants, he returned this evening; the distance is about eighteen or twenty miles, and after crossing two small canals near Bangkok, the road is perfectly good and dry, as I expected he would find it.

*March 8th* —Being disappointed in receiving the boats, I called on the Praklang (whom I had not seen since the 28th ultimo) this evening, he said he had given orders about the boats, and

supposed I had got them, those which had brought the people from Camboorie had been detained for them, and the man in charge of them was ordered to wait on me. The Praklang offered to deliver the Thugs over to me, but I could not take charge of them, I warned him of their character, and told him that they annually in India committed many hundreds of murders, where more care was taken to prevent it, than could be done in Siam. I told him I was anxiously waiting for the letters, and (in answer to his question) that I wished to start on Monday or Tuesday, (the 11th or 12th). He told me the king himself, Cromaluang-rak, and Chowkoon-booden would each return an elephant for the presents I had brought them.

The Jaung-Kieuk of the Gyne district, who had accompanied me with a view of obtaining the release of his wife, (who had been separated from him at the emigration of the Talines from the district of Martaban in 1816, without his knowledge or consent, as he was at the time of the rising absent with the Mya-won of Martaban, some mules from the town), who by Burman law, and I doubt not Siamese law also, ought to be given up to him, has been making all the interest in his power to get this government to allow her to accompany him to Maulman; amongst others, Mr Hunter has repeatedly spoke to the Praklang about her, and as he would give no answer one way or other, I this night spoke to him for the first time on the subject, explaining at the same time, that it was a private request, he told me she might go if she had the leave of the person with whom she now lives, and was willing to go, but that he had been told she was not willing. I said I had seen the woman myself, and she had told me she was most anxious to return, as her mother and relations were at Maulman, he promised to inquire into the subject, and we took our leave about 8 P M.

*March 9th* —About noon, dispatched the boat with the letters, giving the messenger ten rupees for the boatman, if he reached Takanoon in ten days. In the afternoon Mr. Hunter was sent for to translate the letters to Mr. Prinsep and the Commissioner, which are almost transcripts of those of which I was the bearer. The force destined for Sangora is still in the river, about five

miles below the palace Pra-si-pi-pat is said to be full of trouble. They discovered yesterday that they had forgotten to embark their ammunition, and in the night all the soldiers from ten of the boats deserted. Though so many muskets have been imported within the last few years, so little care is taken of them, so many have been destroyed by white ants and rust (they are never cleaned) that they are very imperfectly supplied, and for appointments they appear to have none, on the whole, it would be difficult to imagine a people more contemptible in a military point of view, than the Siamese

*March 11th.*—Sent Piadadie to the Praklang for my letter and orders to the Laos people; the clerks told him they had brought them to me, and I had refused to receive them. The Praklang was too much taken up with the dispatch of the fleet, to give much of his attention to my business. They find now they have no water, and nothing to put it in, and are obliged to borrow some casks from Mr. Hunter.

*March 12th* —Sent to the Praklang to propose calling on him this evening, and found he had gone to Pack-nam to endeavour to get the fleet off, from whence he will not return till to-morrow. Received yesterday from the king 240 ticals for another month's expense.

*March 13th* —Piadadie came over this morning, and on the letter to the Laos chief being translated, I found it was not entirely what I required. Pra-Sooren, an inferior officer, (called also Kaloung, or king's slave) and one of the king's personal attendants, (ma-lik, little dogs) are to go up and see matters settled in the Laos country, and on no account is a misunderstanding to be allowed to take place. At about half-past five I went over to the Praklang with Mr. Hunter, who has always been kind enough to act as interpreter, Pra-see, Chowkoon-booden deputy, and one or two other chiefs more immediately connected with the Laos country were present. The Praklang asked me if I had made up my mind when I would start. I said, I had been some days wishing to get away, as the season was getting late, and had now come to speak to him about the orders to Laos. I thought also it was right that I should have an audience of leave from the king, and should take leave of the

prince and Chowkoon-booden, he said neither Mr Crawford nor Mr Roberts (the American envoy) had an audience of leave, and that it was not at all necessary; and that the prince and Chowkoon must have notice before I visited them, that as my business was principally in his own department he saw me at any time in a friendly way I said, though disappointed of not again seeing his Majesty, of course I must be guided by him, and wished to pay my other visits, so as to get away by the 16th On starting, he said he did not wish to detain me, as he wanted to go down again to the fleet, and could not leave whilst I was here He then told Radsithee to inquire when the prince and Chowkoon would see me I requested him to give an answer about Jaung-Kieuk's wife, he said she might go, but she had some debts here which she must pay I told him the woman denied owing any money, but stated she had a good deal of property and some slaves, he said the slaves could not accompany her, but he knew she had debts, part of which he believed had been paid, and part was still due I begged him to order the business to be settled, as I wished to start on Saturday He wished me health, a pleasant journey, and all kinds of good wishes, and said he should think of me when I was gone, indeed, that he thought of me every day now, and always sent me something to eat, and concluded by complimenting me on my knowledge of Siamese customs I reciprocated his good wishes, and said I was obliged for his attention to my private wants and comforts, and we took our leave amidst expressions of his esteem. On our return home we found the prince Chow-fa, who remained an hour, and about 10 r.m Radsithee came in and told me the prince Cromaluang-rak was too unwell to see me To-morrow is the commencement of the new year, and the Praklang told Mr. Hunter to-day he knew the prince would not give up his plays to see any body. The Chow-pra-koon-booden said he would see me on Friday evening I have been fortunate in obtaining permission to proceed to Laos, by which journey I hope I shall be able to throw some light on the geography of 5° of latitude in this country, hitherto never visited by a European, and the very act of traversing the country, when done without violence

to any of their prejudices, will tend to break down the hitherto insurmountable objection to any intercourse with the interior of the kingdom

*March 14th* —Went round part of the town, and along an excellent bazar well supplied with fish, vegetables, meats, manufactures, and drugs ; in short, a continued line of shops for a mile and a quarter down the left bank of the river, and notwithstanding their religious objections to slaughtering bullocks, the same favour is not extended to pigs, of which it is said, not less than two or three hundred are daily slaughtered in Bangkok alone. A few paces off the main street was a cage for some of the public women, with a row of twelve or fourteen small rooms, perhaps six feet by four, opening into a common verandah of about four feet wide, and perhaps six feet high, closed in front with bars like the cage of a wild beast. After breakfast, I sent to the Praklang for a copy of the Laos letter, and was fortunate enough to catch him just on the point of starting for Pack-nam, he gave a copy of the letter, and said he had given orders to the Pra-pi-pat, his deputy, and Pia-taip to settle the Jaung-Kieuk's business. Radsithee came in the evening to say, Chowkoon-booden would prefer seeing me to-morrow morning, and knowing, that he is looked on as a man of great ability and has much influence in the council here, I took an opportunity of letting him know my sentiments.

*March 15th* —Crossed over to Chow-pya-koon-booden's this morning, and found him with his deputy and some other officers engaged in the important duty of looking at some dancing girls, with a band of music close to him, and about sixty people each knocking together two pieces of hard bamboo, and I should think not less than 2000 spectators, the noise was of course stunning. We were seated on chairs below his dais, on which was his deputy crouched at the foot of his couch, and Radsithee, who acted as intermediate interpreter, though Mr Hunter speaks familiarly with him on ordinary occasions. He asked me at entering, after returning my salute, when I intended to start, I said it was my intention to have started to-morrow, but I was detained for the letters to the Laos chiefs. The banging and noise of the bamboos and music continued, we

could scarcely hear ourselves speak, we sat a short time to look at the actors, and taking leave of him, we returned home. About ten girls were enacting a play, the scene was laid in a wild forest in Java, with rocky mountains at one side of the theatre, constructed of boards painted blue and red, and a few branches and artificial flowers stuck about them, with steps concealed, at least where we sat, for the actors to climb amongst them. The theatre had no stage nor any shifting scenes, but was covered in, and had raised standing room for the spectators in rows above and behind each other, as in the Roman theatres. The piece represented a princess, who by philters was induced to run away with some low person. The old man seemed to take a childish interest in the thing. He is the most famous general in Siam, and distinguished himself amongst the Siamese in the last Cochin-Chinese war. After coming from his house we went for a few minutes to the house of the prince Chow-fa, where we met Mr Jones, one of the American Missionaries. From the prince I got Mr. Crawford's account of his mission to this court, which he had understood, he did not, however, make any comments on it. I asked him, in return for the map I had given him, for any geographical information he had regarding Siam, he said none existed, and expressed his surprise at the extent and correctness of Mr Crawford's information. He said he was anxious to get the king's leave to make a map of the kingdom from survey, but as he was the only man in the country who could do it, he could expect no assistance.

*March 17th* —Received the letters for Mr Prinsep and Mr Blundell, the former is in a stand representing a lotus flower, the latter in a red silk bag, and the same large boats which brought us from Tat-Chin, were sent for our conveyance to Nak-outcha-thee. In part for the sake of seeing more of the country, and in some measure from necessity, as the water is so low in many parts of the Zimmay river above the junction of the May-nam that much time would be lost at this season in digging away the sand, I have made up my mind to proceed to Nak-outcha-thee by water, and thence by land to Zimmay. I have been furnished with a passport from the ministers bearing their official seals, and stating that I had come with presents

from the chief of Bengal, and was proceeding to Yahine, Zimmay, Lagon, and Lebong, and ordering all the different chiefs of towns to pay us attention, and supply us with all necessaries. I conceive it might be turned into a sort of roving commission, as the Praklang told me when inquiring about the road, that he knew nothing about it, he had never been there, so no particular chiefs are mentioned, but to all we may fall in with. The person who is appointed to go with me to Nak-outcha-thee came this evening, and told me it would be necessary for him at this season (new year) to renew his oath of allegiance, so that I fear I shall not be able to get away to-morrow.

*March 18th*—The Praklang returned last night from Pack-nam where he had been to see his brother and his fleet off, and as the detention of the people to swear allegiance to-day had detained me, I sent the port captain to him to say I wished to see him to take leave this evening, as I intended to start early in the morning, he excused himself (as I expected) on the plea of indisposition, but wished me a pleasant journey, &c. In compliance with the Praklang's instructions, Pia-pi-pat and Pia-Taip on the evening of the 14th sent for the Jaung-Kieuk and his wife to the Praklang's hall of justice, to determine whether, and on what terms, she would be allowed to accompany him. It is one of the highest courts of law in the kingdom, and I thought it too good an opportunity to witness a trial to be missed, and went down to the hall privately, the judge, Pia-pi-pat, gave me a seat on the bench, that is, on the floor beside him, plaintiff and defendant set themselves down before us, without regard to any particular arrangement, one or two other low officers were seated near the litigants, and several other people lolling about the floor near us. The place was the passage up to the Praklang's house, and looked like any thing, according to our notions, but a hall of justice. All the people spoke at once, some laughing and joking in the middle of the proceedings. The decision was, that the woman should go as a matter of favour, but that she must pay 755 ticals debts due, and 319 ticals lawyers' fees. On some old law pleas this last sum, however,

she was told should be remitted, but the form of a reference to the Praklang must be gone through ; and this evening I told Piadadie to ask him to give an order on the subject

*March 19th.*—Left Bankok at noon, and in fifteen minutes (against the tide) entered the creek just below Chow-fa's palace, which communicates with the Soop-Ham river, and in ten minutes reached the landing place on the left side of the creek, where the road to the town of Nak-outcha-thee commences Here one boat being much crowded, I landed fourteen of the people, with a pass from a writer in the department who accompanied us, to proceed thither by land. At 2 P M the tide set so strong down the stream, that we were obliged to halt till 5 P M, when we started again, and at seven were overtaken by a boat with a present of dried fruit and pickles from his Majesty, after taking which on board, we pulled on for the greater part of the night

*March 20th.*—At 6 A M reached the new fort and town of Moun-g-tat-chin, where we breakfasted The Myo-won, a very intelligent person, came to the zeat after breakfast, and expressed much interest about our present position with the Bimans We left Tat-chin at 10 A.M., but were obliged to come to a halt at eleven, from the strength of the tide At 3 P.M the tide being nearly done, and having little but the force of the stream to contend against, we started again, and at 4 passed the branch of the river which running westerly communicates with the May-klong. On the angle of the right side of the bifurcation stands the old town of Tat-chin, even now a very long village, containing four or five hundred houses in a row, two or three deep, along the bank of the main river, and this branch At 8h. 20m entered, on the left side of the river a small creek, which cuts off an angle of it, so narrow that at one or two turns we had some difficulty in getting the long boat round. There were two or three small villages on its banks, and a few cane fields, but, generally the banks were low, and covered with dune or nipa From this, at 11 P M, we again entered the main river, and pulled on for a great part of the night.

*March 21st.*—Start at 5 A.M., and at ten halt an hour for breakfast, (myself and people having had no dinner yesterday,)



that of the boat people was brought ready cooked from Tat-chin. At 4h. 30m landed at Nak-outcha-thee, where our people had arrived yesterday. I found the Palat and Yenkabot, (Tset-Kay and Na-Kan), waiting to receive me, the writer who accompanied us, having arrived an hour or two before us. I requested they would this night hand over the elephants to us, as I wished to see all right now, and start at daylight in the morning, they wished to put it off till the morning, but as I insisted, they sent people to bring them in. I told the writer I expected he would see, that a guide was furnished to the next halting place, as I could not, after the falsehood they had told me here on my way to Bangkok, put any trust in what their people said, it would disgrace the king and nation of Siam, when heard in other countries, that men at the head of a town condescended to such meanness. They attempted some explanation, but did not appear at all ashamed. About ten o'clock the people came back, and said one of the elephants had broken his hobbles, and that two of the remaining three had gone after him, so that they could not give them over to us this night, which will I fear cause another day's detention.

*March 22nd*—Received the elephants to-day at 12 o'clock, which the government return for the presents brought, none of them remarkable for their appearance, and I did not receive the howdahs, which were in a most rickety condition, till about 7 P M. Had a visit this afternoon from a lad dressed in a blue jacket and cap, white stockings and shoes, (and half a dozen other lads in the same costume, except the shoes and stockings) who pretended not to be able to speak Siamese, and as he could not speak any other language I was acquainted with, our communication was of course extremely limited. After he was gone I learned that he was the son of the priest, the eldest legitimate brother of the king.

*March 23rd.*—Ban-Sao, four hours fifty minutes, thirteen miles. Left Nak-outcha-thee at 6h 25m this morning, and travelling along the bamboo jungle, (which ran to the N. E. of our march on the way to Bangkok,) reached this place, having halted some time for the elephant at noon. There were a few inhabitants in the immediate vicinity of the road, the villages lying along

the edge of the jungle, near the plain which runs down to the head of the Gulf, as before mentioned. At 7h 45m. we crossed a muddy nullah, and at 8h 5m a larger one by a bridge, at 8h 15m passed Ban-pa-neat, at 9h 15m Banroi, at 9h. 25m Bon-ta-ko; at 9h 55m a larger village, say sixty houses, and at 12 halted here. The elephants came up at 1h 35m. Last evening we heard an unusual rumbling noise, exactly like distant artillery, and in the night felt three or four shocks of an earthquake, the weather has been hot and sultry for some days, and yesterday at noon the thermometer stood at 106° in the tent, and some of the people from the heat did not come up till seven o'clock in the evening. We have had several sick for the last ten days, two cases of fever, one of small-pox, and one severe diarrhœa.

*March 24th* —Ban-soap-la, four hours, twelve miles. Started this morning at 5h. 45m and almost immediately entered the bamboo jungle, quitting the plain on the edge of which we halted last night, and have not seen it since. The road throughout the day, and since 8h 5m yesterday, has been good, and practicable for the carts of the country, one of which, drawn by buffaloes, hired by some of the traders has accompanied us. Water is scarce at this season, and what there is, is bad. At 6h 25m passed Bancong of fifty houses, at 6h 45m a small plain with a little cultivation, at 7h 15m a Laos village, of about thirty houses, at 7h 25m another of the same people, of ten houses, at 8h 15m Bantoom of ten houses, inhabited by Siamese, at 9h a plain of some nine or ten miles circumference, apparently fertile, but from the great depth of the water in the rains could not be brought under cultivation. At ten we halted here near a Laos village of fifteen houses, about one long day's march west from the Nak-outcha-thee river, which between this and Soop-Ham winds away east. The country continues thinly populated, notwithstanding the endeavours of the Siamese to make it less so, by locating here the unfortunate prisoners from Weeang-tchan, in southern Laos, which was taken by the Siamese in 1826 or 27, and the most horrible cruelties practised on the miserable inhabitants. Isoboa was kept during the short time he survived in an iron cage, with different instruments of torture along side of him, and obliged to proclaim, that

the king of Siam was merciful, and his punishment deserved, being an old man, his brutal enemies were not long gratified by the sight of his sufferings.

*March 25th* —Nong-Keam, 5h 20m fifteen miles Started at 5h. 25m and continued our march through the same description of country, viz nearly a dead level soil, and a sandy loam covered with bamboo jungle, at 6h 35m at Banyong, a small village of Siamese Cross the water, the banks of which we left at day-light, and which I now find is a stream uniting itself with the Nak-outcha-thee, though it was so choaked with water lettuce and other aquatic plants that no stream could be discovered in it Here we obtained a fresh guide, and proceeding a few miles, entered a tree jungle, more open, which continues till 10h. 30m. The village Kalay-Book, of ten houses, from whence to this place, Nong-Keam, a muddy swamp of bad water, which we reached at 11h 30m, the jungle is again bamboos We have seen no cultivation to-day, and both the small villages we have passed clear the jungle (which only grows on grounds slightly elevated), for their paddy, and do not cultivate the plains which have too much water on them, one in this vicinity is only now becoming dry The people had been employed in taking fish left in the mud, and appear to have been very successful, at 9h 30m we passed the Nakan (Yenkabot) of Nak-outcha-thee in the jungle, he said he had been sent by the Myo-won to see to my provisions, and that the people did not take me by the western road, on which water is very scarce at this season, he came up the river, which is distant east six or seven hours march. The people of the village (Kalay-Book) where he slept last night, were obliged to furnish him with a large portion of their fish Weather exceedingly hot, thermometer at 2 P.M 130° in the sun. The elephants did not come up till 3 P.M.

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*Points in the History of the Greek, and Indo-Scythian Kings in Bactria, Cabul, and India, as illustrated by decyphering the ancient legends on their coins.* By CHRISTIAN LASSEN, Bonn, 1838.

The translation of this interesting and erudite work has been undertaken for the Journal by Dr Roer, of the University of Berlin, a gentleman whom high acquirements, and sound knowledge of general literature, render fully competent for the task. The critical nature of much of the work calls for as close a rendering of the original as may be possibly given with reference to ordinary difference of idiom. Should the style therefore appear at times too German, it must be remembered that grace of expression has been voluntarily forfeited to secure what is so infinitely more valuable—as indeed it is the only real merit of a translation of this kind,—accuracy and fidelity as respects the original.

This work will, it is hoped, be generally welcome to our readers in its present form. It is invaluable to the historical student, and numismatist, while the extreme ingenuity exhibited in treating the subjects discussed, is such as to command the attention of the general reader. Founded as it is in a great measure on the researches published in this Journal by JAMES PRINSEP, we must receive it with pride, as a tribute to his genius, his singular intelligence, and indomitable zeal for the cause of knowledge, while with a more chastened feeling, we see in it honourably preserved the memory of one, who was for so many years the chief ornament of this Society, the recorder of its transactions, and the most eminent of all its members in many branches of science.

The translation will be continued in the Journal till the work is complete, a hundred copies of each paper being struck off above the number required for our circulation in order to supply the whole in the form of a book, to those who may desire a readier means of reference to its contents than the Journal might afford. I should mention, that I owe the notes signed H T P to the kindness of Mr Henry Thoby Prinsep.



## INTRODUCTION.

Among the different empires which were formed on the dismemberment of the conquests of Alexander the Great, none were placed in a position more remarkable and peculiar, in a geographical and historical point of view, than the Greco-Bactrian kingdom, and the Indo-Grecian kingdoms, which found their origin in it. These were called into existence, when the course of those great historical events was already complete, by which the plastic, and intelligent genius of the Greeks had been united to that of the imaginative and pious, or according to the view of others, superstitious Orientals, and by amalgamation of the west with the east, produced a new formation of historical relations, viz., Hellenism. Though the Greek in Bactria proved still the strenuous soldier, inspired with the remembrances of the exploits of Alexander the Great, and his companions, yet he was no longer the rugged Macedonian of the old campaigns, full of local nationalism: for he had become, in the luxurious capitals of the Seleucidan kingdom, already too well accustomed to Oriental manners and modes of worship, and when proceeding from the banks of the Tigris and Orontes he reached the eastern parts of the Greco-Asiatic empire, he met there with natives already in a great degree acquainted with his peculiar customs and institutions. Thus the wounds received in the first fierce shock of jarring contrasts were already beginning to close

Now as by the establishment of the Bactrian empire, the mighty process involving the formation of a new era was roughly completed, elements must have been admitted as agents in that process from the remotest east of Bactria and Sogdiana, congenial to those countries. The Bactrian was, as an inhabitant of the highland of Iran, far other than the Oriental of Syria, Egypt, or Asia Minor, and he was, even among the tribes of Iran, of a peculiar stamp. If any where, Zoroaster's doctrine of light must here have been preserved most purely, and thus in the amalgamation of Oriental and Hellenic character, Bactrian Hellenism must have been formed from the beginning in its own way, a smaller circle in the great revolution of the east.

But when the Greek power passed the Indian Caucasus, a new contact of the Greek character with the Oriental was the necessary consequence; there it met with an essentially Indian civilization, seldom affected by any foreign influence.

After Alexander had flashed like a radiant meteor through those Indian regions, they soon returned under the sway of Indian rulers, and this happened at a period when the power of a new Indian religious doctrine, viz the Buddhistic, was about to propagate itself with zeal in this direction, together with political dominion. In consequence, the Greek kings of Bactria found in the valley of the Cabul river the peculiar characteristics of India more vigorous and more deep rooted than Alexander did before, and Hellenism\* therefore was compelled to begin anew in a narrower circle, and on new ground, the same career it had already run through in a larger one. However, time and strength were wanting to carry out this last experiment. For as the Greek character, at such a distance from the reviving influence of its home, could not manifest itself in these remotest regions with the same degree of vigour as in the more western spheres of its activity, so it was here most easily overthrown.

With the dominion of the Scythians over Bactria and on the borders of the Indus, the political influence of the Greeks was abolished for ever, and in the sphere of art that influence is only obvious in efforts, waning more and more, though it may be traced even among the Scythian Nomades.

Thus Bactria and the country to the south of the Caucasus appears as that territory in which Hellenism was first restrained from spreading to the east, and Asia proved here triumphant against the Greeks, but only as destructive of their systems, not as creative of others. For a longer period Greek influence continued to prevail in the empire of the Arsacides, the friends of the Greeks, who did not engage in warfare against Greek civilization, but only against the Roman spirit of subjugation, while the Sassanides called in the spiritual power of a revived

\* NOTE —It is proper to remark that this word is used in a peculiar sense by German writers, as referring to that moral and social state consequent on the union of Greek and Asiatic character at that period —TRANS

religious doctrine to assist them in general opposition to all attacks from the west.

Upon no other ground than the above mentioned, on both sides of the Indian Caucasus, have the various forms of doctrine and life, which antiquity has produced, approached each other so nearly and so immediately, in successions alternately attractive or repulsive, vivifying or annihilatory. In Cabul the paths cross, which lead down through regions more and more torrid eastwards to tropical climates, which pass through Arachosia westwards to the mountain-valleys of the Iranians, to the plains of the Semites, and to the coast of the Javanese Sea, which traverse mountains of eternal snow northwards to Bactria, and as they separate, give the caravans a free passage to the pasturing plains of Tartary, to the remote towns of the peaceful Seres, and to the infinitely varied nations of the west; there met the worshippers of Zoroaster and Brahma, the apostles of the Buddhistic quietism, and the artists who opposed the plastic forms of the Hellenic gods, to the grotesque symbols of the east, here came together the cautious Baman with the merchant from China, and in the royal armies, Hindoos upon their elephants and the bowmen of Sacia halted near the serried Macedonian phalanx and the well ordered squadrons of Bactria.

On this cross road of historical formations was the Greek placed in Bactria. He was privileged at this post, most advanced to the east, as it were, to open with the right hand the Vedas of the Brahmans, and the Nosk of the Mazdajasnes; with the left, to shake the locks which closed the gates of the great Chinese wall, and the entrance into the empire of the "Central land" In our days has the western world first achieved a similar position, from a far greater distance indeed, yet though with infinitely more increased, and multiplied means, perhaps not with greater success? neither has the Chinese empire yet become more accessible, nor has Indian heathenism lost even an inch of ground.

These intimations may suffice to bring to mind the importance as respects universal history, which might be claimed for the history of the countries at the borders of the Oxus

and the Cabul river, from the time of the death of Alexander the Great to the expiration of the dominion of the Sassanides : on the other hand the succeeding history of these provinces under Mahommedan sway, is as cheerless as the Arabian desert.

The interest and importance of the Bactrian history will scarcely be disputed, although it appears far from being possible to trace this history, not in general shifting intimations, but in clear, lively, and distinct outlines, for our information about it is in inverse proportion to the importance which the Bactro-Grecian empire ought to enjoy in history Bayer's\* learned treatise has long ago proved, how little the Greek historians thought it worth while to pay attention to the fate of their own countrymen in the distant east The geographical work of Strabo would be infinitely more valuable for the historian, if he had stated such facts as he knew, instead of giving some few detached, and confused notices on the Bactrian kings I for my part, would willingly resign for this all his discussions on the Cuertes, and many similar things

Thus this history was hitherto only the subject of the laborious diligence of the learned collector, not of the narrating historian, and it will probably remain for a long time in this state, however, every hope of acquiring at a later period a firmer base and a more fertile field of inquiry is not lost. This hope rests upon the discoveries of the last few years, as well as upon the supposition, that their mine may not yet be exhausted.

Just a hundred years ago Bayer signed the preface of his acute treatise, and during the ensuing eighty years nothing appeared, that could have corrected or enlarged in any essential point his investigations. The history of the Bactrian Hellenes continued to be a catalogue of mere names of kings; a catalogue, as destitute of facts as laboriously arranged, and scarcely plausibly complete.

The last deced of years, and chiefly its latter half, has brought to light new monuments of that history, so unexpected and so valuable, that the hope above alluded to, seems not to be quite

\* *Historia Regni Græcorum Bactriani* Auctore Theophilo Sigifredo Bayero Petropoli, MDCCXXXVIII 4to



fallacious The external outlines of the Bactrian empire, and of those Indian states that originated in it, come out already more distinctly in connection with many detached facts of their internal formation. From things scarcely noticed, while the loss of written accounts on the fate of those empires, viz. the Bactrian, and the Indian, (for more to suppose, there was no reason) was lamented, even from those neglected things we have derived that unexpected benefit, and this from a quarter whence it was least hoped for There have been found coins of those very kings at the seats of their former dominions in Bactria, on the banks of the Cabul river, and in North-western India. These are the most authentic sources we can desire, and what assistance coins may supply, where written accounts do not exist, has long been evident from the history of the Seleucides and Arsacides

It is the design of the following pages to examine those newly acquired relics, in a light under which they have been hitherto looked on as least likely to afford results to the historical investigator. I do not intend to relate here the history of these newly cultivated numismatics, chiefly because my work is not to be a numismatical treatise. It is rather for the numismatical inquirer, who may hereafter compare all the coins of the Bactrian and Indian empires, and the Greek kings, to relate that history. Here the following outlines may suffice

Since Bayer wrote, and before the last rich discoveries, some few single coins arrived in Europe by different ways, and were then published Being merely unconnected, and scarcely supplying single deficiencies, they still excited the hope, that by degrees so much might be collected, as in time to yield more important advantages —thus the coins received through Russia, which Koehler in Petersburg, and Tychsen\* at Gottingen have described, and likewise those which were previously collected by Tod in India, and afterwards published in England.†

This state of things continued till the year 1834, when

\* The latter in the *Commentt Recentt. Gottingg v vi ct phil*, the former in detached little treatises

† In the transactions of the Asiatic Society of Great Britain and Ireland, vol 1 p 313

the celebrated French academician, Mr. Raoul-Rochette, published some new coins of the Greek Bactrian kings, and their Indo-Scythian successors, which were received by way of Russia.\*

While he was editing that learned work, those investigations and discoveries had been already made, which have so much enlarged our knowledge, and will probably furnish us with still ampler stores.

At that period Burnes had already achieved the journey, by which the Indian Caucasus and Bactria were again opened to us. Nor had his journey been unprofitable for Bactrian numismatics, as the appendix to his well known work proves. But all these detached acquisitions are inferior to those which were effected at the same, or the immediately ensuing period in India; we shall briefly mention them. Three nations share in them.

The generals Ventura and Allard, as well as another officer, M. Court, three Frenchmen in the service of the Raja of the Sikhs, were first favoured with a rich crop by collecting on the spot, but chiefly by digging in the tombs which are called *topes*, particularly in the tope of Manikyala. An Englishman settled in Cabul, Mr. Masson, made further collections in the ruins of ancient towns of that country, out of hill-tombs, and by zealous inquiries in the bazars, at the same time a German from Vienna, Dr. Martin Homburger, who travelled much about in the East, was successful in collecting by the purchasing coins and opening *topes*. These rich and surprising discoveries, published at short intervals, have excited among the English in India an increasing ardour of investigation, and the number of collectors is already too great to publish here the names of all. Upon these discoveries, and upon the hope of extending the inquiries to yet untouched seats of former civilization, is based the confidence, that our acquisitions are not yet closed.

\* Notice sur quelques médailles grecques inédites, appartenant à des rois inconnus de la Bactriane et de l'Inde, in the *Journal des Sav* 1834, p 328  
Here are likewise enumerated the numismatic acquisitions made from the time of Bayer up to that period

It will be necessary to specify more accurately the writings in which these discoveries are described, and the coins represented.

Mr. Masson has described his discoveries in three accounts,\* his statements being of singular value, concerning the places of discovery, and the geography of some points in Cabul. His collection contains already more than 7000 coins, not all of which, however, refer to the Bactrian Greeks and to their Indo-Scythian successors. The interpretation of the coins, and the inferences joined to it, prove indeed, that Mr Masson has not enjoyed a learned education, he is beside destitute in Cabul of all scientific materials; grateful therefore for such a laudable expenditure of time and labour, and for such a noble zeal, we shall not criticise his deficiencies, and willingly receive from him all that is capable of proof. Mr. Masson, I believe, served first in the artillery, and he knows certainly much better how to deal with numismatic inquiries, than most numismatists would know how to serve a gun.

The most instructive accounts from India on the newly discovered monuments of the Greco-Bactrian and Indo-Scythian period, we undoubtedly owe to Mr James Prinsep, Secretary to the Asiatic Society in Calcutta. He has communicated to us continued accounts of all new discoveries, has carefully and accurately edited the coins, and has, with great diligence and acuteness, tried to explain them, and by demonstrating the connexion between the Indian and the Indo-Scythian numismatics, first established an entirely unexpected new and important fact. His decypherings of the native medalography, and his interpretations of the native legends in Greek characters, leave to succeeding inquirers only the task of rectifying and defining more precisely a few isolated points. He deserves the higher praise, as he is his own teacher in the province of numismatics, originally foreign to his studies. His beautiful discoveries in the old Indian paleography, concern, more nearly than he perhaps presumed himself, the explanation of the Bactrian coins, and we are entitled to expect still richer contributions from his ardour.

\* In the *Journal of the Asiatic Society of Bengal*, vol. III p 152, with engravings, which leave much to be desired.

By his treatises, published in the above-mentioned Journal, we are best able to observe the course, and the gradual increase of those discoveries.\*

The collection made by Dr Honigberger, as well as that of General Allard, and a portion of Ventura's collection, have been brought to Paris, where Mr. Raoul-Rochette edited and described them † Mr. Raoul-Rochette is so well known to all European learned men as a solid and acute inquirer into antiquity, as well as an experienced and judicious connoisseur of ancient art, that I need hardly declare that the explanation of those coins could not have been intrusted to more skilful hands. He who is not a numismatist, will be doubly obliged to him for the exactness with which he exhibits every trace of historical references, preserved in the coins.

Though the Germans could not share in editing the coins, yet they have been fellow-labourers, as well in the collecting, as in the interpreting of them I have to mention here two learned men,—Mr K. O Mueller, at Gottingen, who had already published‡ a detailed account, full of striking remarks, on the newly acquired coins But of much greater importance is his lately published treatise on Indo-Grecian coins.§ It is an example as clear as solid, of the new results which the history of those countries has gained by those coins.

\* They are chiefly the following, vol III p 313 On the coins and relics, discovered by M le Chevalier Ventura, in the tope of Manikyala P 436 Continuation of observations on the coins and relics, &c at the same place, p 562 Notes on the coins, discovered by M Court, vol III iv p 317. Further notes and drawings of Bactrian and Indo-Scythic coins, at the same place, p 621 p 668 On the connection of various ancient Hindoo coins with the Grecian or Indo-Scythic series. vol v p 548 New varieties of Bactrian coins from Mr Masson's drawings, and other sources, at the same place, p 639 New varieties of the Mithrac or Indo-Scythic series of coins and their imitations, at the same place, p 720 New types of Bactrian and Indo-Scythic coins.

† Supplément à la notice, etc Journ des Sav 1835 Deuxième supplément à la notice, etc at the same place, 1836 Both likewise in a separate edition, after which I shall make the citations

‡ Goettingen Anzeigen 1835 No 177 p 1761

§ At the same place, 1838 No 21 p 201

Dr Giotefend, from whom we have since received an excellent essay on the decyphering of the Celtiberic alphabet, had proved already, by his work on the unknown writing of the Bactrian coins,\* that he possessed the zeal and talent to aspire after the fame his worthy father had acquired in the art of decyphering,—his work having been independent of that of Mr Prinsep, is a direct recommendation of their labours, as both have obtained almost similar results I shall shortly mention, what still may be amended in them

It is then the design of the following work, to rectify and enlarge the decyphering of the alphabet, to define the language of the native words imprinted on the coins, and to illustrate the relics of the written history of the Bactro-Indian kingdoms, according to a paleographic and philological view

The author being no numismatist, does not conceal to himself, that he cannot depend upon his own judgment in numismatic investigations However, for this part of the explanation of the Bactrian coins, he was so much prepared by the preceding works, that he was, while at work, but seldom sensible of the insufficiency of his knowledge in this respect Should he sometimes have ventured to recede from the inferences of the numismatists, they will, he hopes, excuse him for this little deviation from their authority if, on the other hand, he may succeed in completing in some instances their inferences by his investigations, for perhaps few of them will be familiar with those authorities by means of which he proposes attempting to advance the whole subject a step further

As the Bactrian empire was placed in the centre of communication, crossing from west and east, from north and south, the modes of research for interpretation of its documents and restoration of its history, must unite from various parts, in order to complete the investigation The Grecian, the old Persian, the old Indian, and the Chinese philologies meeting here, in close contact, must mutually supply their respective deficiencies.

I shall now more distinctly define the subject of my work.

\* *Blätter zur Münzkunde* (leaves on Numismatics) 1836 No 26

When we meet upon the coins with legends of a twofold writing, viz , a Grecian and another unknown, we dare positively assert, that the names written on the one side in Grecian characters, must be repeated on the reverse. From this point of view Messrs Prinsep and Grotefend have also found the alphabet, which I have to rectify only in a few points, for in the main point the decyphering of the alphabet is already completed.

If I may be allowed to state beforehand, in what respect both have been mistaken, it appears to be the following.—Neither of them has succeeded in the choice of words to explain the appellatives in the native language, in consequence of which, both have adopted some spurious letters Mr Grotefend had not at his command coins enough to observe this mistake in the application of these words to proper names, besides, the legends have become so indistinct, that without comparing many copies, it is often impossible to find the real shape of some letters, or the proper native orthography Mr. Grotefend appears in general not to have borne in mind, that the native language might be of such a nature as to require an orthography different from the Grecian, and he therefore adapts also the vowels to the latter, though the native writing has its proper system of denoting vowels, from which it is not allowed to depart

M<sup>r</sup>. Prinsep has arrived at this system, but as he does not apply it with sufficient exactness, he is mistaken in the reading of an important letter, and obstructs his own way to an accurate knowledge of the native language Though he is quite correct in supposing, that the native orthography must not always copy every Grecian letter, yet, he does not accurately define the nature of those deviations, and is too easily satisfied with a groundless difference in the orthography

With regard to some letters, the proposed alphabets present also differences in shape too great to allow their adoption, without a more careful examination

It would be unjust to mention this censure, without adding at the same time, that my alphabet is entirely grounded upon that of my predecessors, and that the merit of the real decyphering is due to them.

## FIRST PART.

## DECYPHERING.

*Fundamentals of Decyphering.*

I first put together a number of letters, about which there cannot be any doubt, and which have been read in the same way by Messrs. Prinsep and Grotefend; to these I shall add some others, concerning which I differ in opinion from one or the other, and I shall state my reasons. In connection with this, I shall make some previous inferences, as well on the character of the alphabet, as of the language.

1. ʔ, A. This is established from the names Apollodotos, Antialkides, Antimachos, Azes, and Amyntas, in which it is the first symbol. Mr. Prinsep observes this letter to be written as only initial.\* This is so far to be limited, that it is only written when the syllable commences with A, just as अ in the Indian alphabets, for in the name Antialkides, we find ʔ in the middle of a word, according to Mr. Prinsep's own latter remark.† Mr. Grotefend, according to the coins, has stated four varieties of the shape, but they are all really the same, and well preserved copies represent only the foregoing character.

After a consonant which has the vowel, A ʔ is never met with, from which we infer, that the sound A is accounted inherent in the consonant, and is not represented by an express symbol. On the other hand, we shall find proper symbols of vowels, whenever a consonant is followed by any other letter than A; it appears here, therefore, the same system of orthography as in the Indian alphabets, and in the arrow-headed writing. For the omission of A, when the syllable has a final consonant, and for which the Indian alphabet has adopted the symbol of pause (*Virāma*), there is not found any symbol in our legends, as it does not occur in the arrow-headed writing.

2. P, O. This symbol occupies always, (with the excep-

\* As. Jour No v p 722


† As. Jour. No. iv. p. 329

tion of a single word, viz. the name in the native legend upon the coin of Agathokles,) the final place of a word; all authentic words do also end in P. Hence, because O is the termination of the nominative singular masculine in the Zend, and because an omicron occupies the final place whenever native words are rendered by Grecian letters, as for instance PAO, KOPANO, Mr. Prinsep infers,\* that P must be the same with O. Mr. Grotefend has arrived at the same result, and has noted eight varieties of the symbol, two of which will prove genuine, (the fourth and fifth), the others, however, are partly mutilations, partly real, but indifferent deviations. In accordance with Mr. Prinsep, I can admit only two varieties. P appears† often with a small cross line below, a peculiarity, which, however, will recur in many other letters. But whether the round above be closed or not, is quite incidental.

To the reasons alleged by Mr. Prinsep, I add also, that the most common dialect of the Prâcrit, instead of the A of the Sanscrit, substitutes likewise ô in the nominative sing masc. This is indeed the case only with masculine words, ending in A, but they form, as well in Zend, as in Sanscrit and Prâcrit, by far the most numerous class of words. This nominative, therefore, refers also to India, as the native country of the Zend, and decides nothing about the language upon the coins.

Whether P must be read as ô long, or as short o, *a+u*, is not easily to be decided. The Sanscrit has but a long ô (compound of a + u). In the Zend, ô is likewise a diphthong, to be considered as the coalescence of a and u, though one of both forms of ô may have been shortened in the pronunciation; for

\* As Jour No. iv p 329

† For a long time Mr James Prinsep, with Mr Grotefend and the author of this essay, read the character  as a form of the *ju* or *ô*, but he latterly rejected this reading, and adopted the Sanscrit genitive as A instead of the Zend one of O. The character was universal as a final of names, and was evidently an inflection. The reasons for his reading *p* as an S will be found in pages 642 and 643, vol vii of the Journal, that is, in the Journal for July, 1838.

Mr Lassen has admitted his preference of the reading of this letter as S, in a letter to Mr. Prinsep we shall presently quote at length.—H. T. P



it appears in instances where the Sanscrit renders A by the Greek O for instance, Bharait (Bharêt) Zd Barôit, Gr φέροι

The long ô of Sanscrit is generally kept in Prâcrit,\* particularly in the terminations, though the shortening of this vowel must be admitted in some instances. The contiguous languages, (for I scarcely need to say that the language upon the coins must among those three meet with its relation) seem to coincide in proving the P to be ô. That P cannot be an entirely short O is evident from the fact, that the Greek omicron is never rendered by P, as for instance in Apollodotos. But because for the termination P the Grecian paraphrase puts also an O, this intimates, undoubtedly, that the pronunciation of P is at least shortened in the terminations.

For the above reading of the letter P I could not plead its use in the legend upon the Agothokleian coins, for the authenticity of the word is not quite settled. Mr. Prinsep supposes this legend to consist of two words, both ending in P; I rather think it a Greek word, in which P would correspond to ω. The Parthic name *Vonones*† requires ω in the second syllable, according to Grecian orthography, however, the native representation of this name is matter for discussion, which cannot be entered upon at present, I shall therefore be satisfied now to denote P by ô, and with the above mentioned restriction, I think it long P.

3. ∪ M. The fixing of this letter belongs to both my predecessors, and is confirmed by the names Antimachos, Menandros, Hermaios, Diomedes, and Amyntas.

The symbol often has below the small cross line ∩ already alluded to; it may even be connected with the main figure by a perpendicular line ∪

The form ∪ occurs for the syllable ME in Menandros, for MH in Diomedes, for MY in Amyntas.

From the name Menandros, and from the application of this symbol to other consonants, followed by the vowel é, Mr. Prinsep has inferred, that the perpendicular line must be the sign of short è. This opinion is certainly right, and will be

\* My Grammar, p 150

† The noting of Vonones has been given up by Mr Lassen

fully confirmed. The  $\iota$ , following consonants, is always represented by this line, which, in favour of the figure of some consonants, is rendered also obliquely. In similar manner the  $e$  or  $\iota$  in this place is denoted in the old Indian alphabets by a mark above, connected with the consonants. Mr. Grotefend, following the Greek alphabet, has incorrectly adopted  $\omega$  as the representative of the vowel in  $\omega$ ; if this be so, the same sign must represent  $y$  in Amyntas,  $\hat{e}$  in Diomedes, and  $\iota$ , if there is  $\iota$  in the Greek, as for instance, with  $\eta$  in Antimachos. It is evident, that it always is the same vowel, which did not sound differently in different words, but is always  $\iota$ , and that the native language substituted the same one for those four Greek vowels together, this supposition agrees also much better with the nature of those languages. They all reject the  $v$ ; in consequence, we find  $\omega$  in Amyntas, as it was the sound, most congenial to the ear. When upon the coins *Dijamidô* is written for *Diomedes*, we ascribe it to the pronunciation of the  $\eta$  as an  $\iota$ , which already had stolen in, the vowel, however, in this instance must be long. But because we also do not find the long  $A$  differing in orthography from the short  $A$ , the objection taken, that our line is likewise substituted for a long  $\iota$ , will be of no consequence.

The position holds good, when the vowel-line may represent  $\epsilon$ . Why was  $\hat{e}$  not written for  $\epsilon$ , seeing that we observed before, that  $\Psi$  though really  $\hat{o}$ , is still sometimes put for  $\hat{o}$ ? Now just, because the language has an  $\hat{o}$ , I am inclined to infer, that it had also an  $\hat{e}$ .\* He who is acquainted with the analogy of languages used in lands contiguous (to Bactria,) will admit of the inference. In the Sanscrit there is no  $\epsilon$ , but there is an  $\bar{e}$ , on the other hand, the Zend has even three  $\bar{e}$ s ( $\bar{e}$ ,  $\hat{e}$ ,  $\epsilon$ ), the first of which is decidedly a short vowel; lastly, there is an  $\bar{e}$  in the Prâcrit,† which is still more frequently shortened than  $\hat{o}$ , but being shortened, alternates with  $\iota$ . In the Zend, the manuscripts give also sometimes  $\iota$  for  $\bar{e}$ ; but otherwise the  $\bar{e}$  is not related to  $\iota$ . Why then was the sign  $e$  not written for the Greek  $\epsilon$ , if that sound was to be

\* I have above endeavoured to express the German sound of  $\hat{e}$  by  $A$  which it resembles. I shall hereafter leave it as it is.

† Vide my Grammar.

met with in that language.' That this was not the case, the names Philoxenos and Hermaios will hereafter prove. The native ê must have been considered too grave to be equivalent to the light Greek ε; the written characters at least had not an ě, as evident from its not having been used in the above named instances; consequently there remains scarcely any other course than to write 1. For the principle of Historical Comparative Grammar, under which in Zend and Greek, ě would be produced by shortening an original ă, cannot be applied to words, written down\* from merely hearing them pronounced. We might rather here apply the analogy of the Prâcrit, which seeks to substitute an ĩ for the shortened ê, as in shortening the sound ê, produced by the coalition of a and ĩ, the element ĩ prevails.

Were the language upon the coins Zend, we must expect an ě; but if it were the dialect of a country upon the Indian side of the Hindu Koosh, we should not be surprised by falling in with the Indian system of vowels.

On the fact, that upon the coins, ĩ only is always substituted for the four Greek vowels ε, ι, η, υ, or for the sounds a, e, ee, y, I ground the proposition, that the mode of writing Greek names was based upon the system of native sounds, according to which the foreign names were changed. It is included in this proposition, that it will by no means be necessary to refer in every peculiarity (observable in the native character), to Grecian orthography. Should we misapprehend this principle, we should run the risk of thinking we recognized the native characters in incorrect positions.

4. ϣ P. Apollodotos is sufficient to establish this letter. Both my predecessors have already adopted it. In Philoxenos also occurs the initial ϣ, from which it is evident, that, the Greek φ not being in the native language, P was substituted for it; the Zend, and the old Persian have f, the Sanscrit and Prâcrit only ph, or P, with a prolonged aspiration. By the want of f in the language upon the coins, we may observe an affinity to the character of the Indian languages, and a diversity from that of Iran. But because there was no letter corresponding to the Greek φ, it still does not follow, that f did not

\* As hev would be in the language under consideration —TRANS

exist ; this cannot be clearly ascertained, until after the examination of the un-Grecian names Unadpherres and Kadphises ; for the Greek  $\phi$  will be only the representative of an f in them.

I observe on this occasion, that thrice in the native legends no vowel sign occurs for the o in Apollodotos, but only the consonant with its inherent a. Though it follows from this, that the language of the coins owned not a pure  $\delta$ , yet we must also bear in mind, that as now in some Indian dialects, so the  $\delta$ , as pronounced of old, when occurring in middle syllables, approached to the pronunciation of o. Though we otherwise had to expect to find the Greek  $\omega$  rendered by u (oo), we nevertheless observe it once only upon these coins, and even there it is not certain. On the other hand, in the merely Indian alphabet of the coins of Agathocles *omicron* is represented by u (oo).

I maintained, that  $\P$  was the initial in the name Philoxenos. Where then is the  $\iota$  (ee)  $\gamma$  on the copy R. R. II. No. 5 we distinctly observe the trace of i, as the sign  $\ast$  appears there. It is therefore to be restored as  $\P$ . The other copies, R. R. II No. 6 As Trans Vol. iv. Pl. XXI No. 2 have indeed only got  $\P$ , pa, but the state of the coins proves, that a part of the character may have been effaced. A fourth coin (As. Trans. Vol. iv. Pl. XXI No. 1) is so much spoiled in its initials, that no use can be made of it.  $\P$  for pi will afterwards sufficiently be proved.

5  $\P$  is for lo in Apollodotos,  $\P$  for li in Azilises, and for ly in Lysias. It is superfluous to repeat here the discussion on this vowel sign. I likewise adopt the l from my predecessors.

In the name Antialkides, there occurs an  $\P$ , though in Greek l is without a vowel. From this circumstance, however, we do not consider  $\P$  as a variety of  $\P$ , but here evidently is a transformation of the Greek name according to the rules of native sounds. The important consequences on this remark, here only hinted at, will be proved hereafter.

On the character itself, I shall only observe, that the small perpendicular line on the left hand is sometimes turned upwards, at least, if As. Trans. Vol. iv. Pl. XXI. No. 1. the apparently well preserved word, by which  $\alpha\nu\iota\kappa\eta\rho\varsigma$  is expressed, is faithfully represented by Mr. Prinsep. But the form I have

adopted is most prevalent, we are not yet sufficiently prepared to enter into full discussion on the  $\Gamma$ , which denotes lo in Philoxenos.

6  $\gamma$ , t and  $\gamma$ , d. It is difficult to distinguish these two symbols, and they are so often confounded, that we might take one for the other. We might be even induced to think, that the language of the coins did not distinguish between t and d, that it perhaps always changed an\* independent t into d, as the common Prâcrit does, or an independent d into t, as the Paizâkî dialect of the Prâcrit,† assigned (as a spoken tongue) to tracts immediately under the Himalaya, and in the Punjab ‡ But let us cite some facts.

The same symbol for t and d occurs in R. R. I. No. 7; there is at least no essential difference, though the  $\iota$  with t is of course represented  $\Gamma$ .

As. Trans. Vol. iv. Pl. xxv. No. 9, the  $t_1$  is almost  $\chi$ , while the d is nearly an angle, at the same place, No. 10, the t is effaced, and indistinct, we find again upon No. 11, t and d quite similar, d has only got the small cross-line we already observed with  $\varphi$  and which never denotes a difference. In t ( $t_1$ ) and d in Antialkides, As. Trans. Vol. iv. Pl. xxvi. No. 9, and No. 10, t is in both instances more crooked, while d appears quite angular, on No. 11 they are both alike, and the  $\iota$  in  $t_1$  is effaced. The t in Antimachos is likewise more curved, and serpentine. As. Trans. Vol. iv. Pl. xxi. No. 3 and No. 4. The t in Amyntas, As. Trans. Vol. Pl. xlv. No. 1 is quite angular, as d in other cases, in Diomedes. As. Trans. Vol. v. Pl. xxxvi. No. 3, the upper part of d has quite disappeared. Apollodotos finally puts t and d close together. As. Trans. Vol. iv. Pl. xxvi. No. 4. gives to t almost the angular form of d, while d is entirely rounded. No. 5 represents the regular d, but a much distorted t; in the same manner, No. 7; and No. 6 is of no use as authority; No. 8 gives t in the angular form with the small cross—besides, there is above at the left

\* Vide my grammar, p. 442

† At the same place p. 15

‡ The reference by Prof. Lassen to his grammar (which I have not) would explain the expression, which I am otherwise unable to gain the force of.—TRANS

angle a small line, turned upwards; the d is here more open than an obtuse angle of 100°. The small line, shooting up to the left, is however met with (R R II. No 14, No. 13) likewise in d, which here completely assumes the form of t, while the t has become more slender, and more like a straight line.

This uncertainty in the character does not only occur upon the older coins which represent a native writing, less carefully executed, for though, according to Mr Prinsep's remark, it becomes more distinct and exact in process of time, still the same difficulty in distinguishing precisely d and t occurs upon the well preserved coins of Azes. Thus upon the coin, As Trans. iv. Pl xxii No 10, No. 1, where the t of the word *mahatô* (great) takes in both the angular form of d, once with the cross-line below, the second time with the final stroke above, shooting out ( ʾ ), while there is upon a third coin (No 2) a t with a final stroke, turned upwards to the left ( ʾ )

If therefore a distinction between both letters is to be made, we are at a loss what characters belong to either of them. Since we are now only in search of the language, and the writing gives us no explanation itself, I only know one way to come to a conclusion. It is indeed proper to read, with regard to names, according to the Greek, because there is evidently a tendency to distinguish t and d from one another, but this tendency may here be attributed to the influence of the foreign names of kings, and it decides therefore nothing about the original rule of sounds in the language. For this the analogy of what occurs in other organs would be the strongest criterion, if p and b, k and g, be likewise not distinguished, we can maintain this as being both t and d. We therefore shall defer the decision of the question as to whether in the language of our coins, the different grades of consonants were confounded.

Mr. Prinsep has explicitly noticed the uncertainty of the characters, Mr Grotefend gives evidence of it in his alphabet, and adds to d some entirely deviating forms. In order not to copy in printing all those little varieties, I have always put for t, ʾ, for ti, ʾ, for d, ʾ, and for di, ʾ, when I adopted the one or the other according to Greek, or from internal evidence; but a final decision must by no means be anticipated, as to this point

Lastly, in discussing this question, the great similarity of  $t$  and  $d$  with  $r$  must be kept in sight, so that it becomes very difficult to distinguish them; however, it would lead to an extreme conclusion to throw these three letters in the same mould.

8.  $\text{f n}$  For this Mr Prinsep adopts  $\epsilon$ , so does Mr. Grotefend, who adds besides five other entirely different characters, as representing  $n$ ; but they have been produced from mistakes in reading, as will be proved hereafter;  $\epsilon$  occurs indeed in the syllable  $na$  of the name Menandrios upon many coins, *As. Trans.* Vol. iv Pl. xxxvi. No. 1 has  $\epsilon$ ; on the other hand, No. 2.  $a. b$  has my character. No. 3 likewise has it, only a little distorted; also *As. Trans.* Vol v Pl XLVI. No. 5 and No 8. particularly the latter, where the curvature is more prominent than in my character, and a point is superadded ( $\text{f}$ ) At the same place, No. 6 has indeed the character as exhibited by Messrs Prinsep and Grotefend At R. R I. No 12, the form is quite indistinct, also No 8 No 9; at No. 10, the drawer seems to have been incorrect The copy, according to Tod,\* is of much less use In Philoxenos, *As. Trans.* iv Pl XXI. No 1, my symbol occurs, No 2 has got the other R. R II, No 6 some mixture of both.

The cross-line below, being proved to be an unmeaning ornament, we have in fact but to choose between  $\text{f}$  and  $\epsilon$ ; and these appear to me varieties only of the same character, according as the middle part of the letter was bent in another way But since the figure  $\epsilon$  occurs also in instances, where it cannot be  $n$ , I preferred the figure  $\text{f}$  for the type.

It might be supposed that, because  $n$  appears so often, the distinction was to be easily effected, and the foregoing discussion therefore might be quite superseded. For we have also to expect  $n$  in Antialkides, in Antimachos, and in Amyntas. But on looking for  $n$  in the corresponding places, we find nothing at all, and it must be directly evident to the unprejudiced inquirer, that *here* the letter  $n$  was not expressed, viz not before  $t$ , at least not by a symbol, placed in the line As to the supposition, however, that the point ( $\text{f}$ ) near  $\text{f}$ , often

recurring in the name of Menandros, might denote the nasal sound, in like manner as in the Indian orthography a point, viz. the Anusvâra, represents a nasal sound (सं Sanscrit संतः, santah), there are two objections; first, the point is met with in situations, where a nasal sound can by no means be expected, as for instance directly with the following letter in Menandros, where it is placed on the left ङ (As. Trans. Vol. v. Pl. XLVI. No 8) and secondly, after ॠ (at the same place) where it could only denote an â.

The name Menandros never exhibits the second n, and for dr there is but one symbol. Mr Grotefend seems to be of opinion, that the last half was omitted, and Menan only extant, but the termination ô is always found, and the name is complete according to the native orthography. There must have been therefore, besides the omission of n before d, which is established beyond doubt by the analogous omission before t, a further alteration of the name. This may suffice for preparatory observation.

9. For X in Antimachos the figure 5 occurs (R.R. II No. 4 and As Trans Vol. IV. Pl. XXI. No. 3) at the same place upon No 4, the character being a little obliterated, is like a 7 I shall write kh; the fixing of this letter is due to both my predecessors.

10. ॠ is accounted by Mr. Prinsep as a variety of l, though he likewise was about to explain it by h\*. He can adduce authority for l, only in the native word for *king*, which he proposes to read *malakáo*, without giving an explanation, as to how this Semitic word may have crept into this place. The proposition to read this word as *maharaó*, he afterwards disapproves of. Mr. Grotefend, however, reads it thus, and he is certainly right with reference to h. But in order not to be hasty in deciding a point so important (for by reading h we render the language decidedly Indian, and exclude the Zend) let us look for a name, in which h occurs. Hermaios is most proper for this end, because the h is initial, we only have to premise, that it must also exhibit the symbol of l, l being



substituted for ε. Now the name (R. R I No. 13) distinctly commences with χ; likewise (As Trans. Vol. iv. Pl. xxiv. No. 3) at the same place No. 1 has ι quite distinctly, with the reservation, that the lower curve of the h is lost, and if the coin be not put in proper position, the last letter appears too erect, while the real position of h would appear to incline to a slope Upon No. 2 the h is effaced, upon No 4 distorted, and the ι has disappeared. The coin (As Trans Vol v Pl. xxxv. No. 11) is distinct, but h here also is in a more erect position than it occurs in usually

The Ϛ often recurs in the title of king, and the beautiful Azes coins define the character, while the native word for *great* will sufficiently confirm us in reading it h, χ as hι is equally evident.

11 The symbol, subsequent to hι, and placed before m upon the above named coins of Hermaios, is more or less similar to a t, but since it must be an r, the great similarity of both, before already alluded to, is evinced by it Both my predecessors also acknowledge the r in the figure Ϛ, Mr Grotefend only adds from the name Eukratides, as it appears, a figure (η) not appertaining to r. Mr Prinsep gives another, which he has adopted from the Hermaios coins, before mentioned, a more accurate examination, and the comparison of the different copies, however, proves it to be but a form of r on a more extended scale I have adopted the more angular form from the Azes coins, and also kept the sketchy approach to the cross-line below, viz. Ϛ, to distinguish it from d

12 I can now take another more decisive step. The word φοι βασιλεὺς so often met with, which Mr. Prinsep read *malakáo*, and Mr Grotefend *maharaó*, undoubtedly consists in accordance with so many copies, of the following letters, ϣϣϣϣ We are already acquainted with *maharaó* The character ϣ which often has two oblique lines, as upon the Menandros coins, (As Trans v Pl. XLVI No 6 No 8), but which in others, is defective in the lower cross-line, is read â by both my predecessors. Neither of them seem to have been aware, that if â be taken in this case as written after ι, it also must occur wherever a long â follows a consonant, so that if the first half of the title be *maha*, the ϣ

must be also placed after *h*, as the word is *mahâ*; the Semitic word *malakaó* is indeed a very doubtful interpretation, while, as the second letter is an *h*, not an *l*, and the third not a *k*, every shadow of identity with it disappears.

If then  $\Delta$  is not *d*, it must be a consonant, and this cannot be but *g*, (dj ज) The word therefore is *mahara-g'ó*, viz. *Great king* Against Mr. Prinsep's\* first opinion, that  $\Delta$  did never occur as an initial, it has been proved by a later discovery†, that the native translation of the word *νικᾶτωρ* commences with a  $\Delta$ , the two first symbols are  $\Delta\Delta$ , and because  $\Delta$  is *j*, we must read *g'aja*, viz. victory, Sanscrit जय, and if there should remain any doubt, I beg to add, that *νικηφόρος* is also translated by the same native word, as upon the Archelaos coins (As Jour. v. pl. xxxv. No. 1)

Let us here only take up the new word, *Maharag'ó*. *Ra* as well as *ha* have in the Indian language a long vowel, but to denote this there is no symbol extant in the legend on the coins Upon some copies, as above mentioned, we meet with a point below the *h*, as upon the Menandros coins (As Jour v. pl XLVI. No 6 and No 8,) but *m* has there also such a point, and even the name Menandros at the last letter before *o* In no case can it be taken for a The point must have another meaning

Hence it follows, that the inscription on the coins, does not distinguish between a long and short *a*, as I have already noticed, when observing on the letter *z* This proposition is of highest consequence for the reading of indigenous appellatives.

I therefore read *mahárâg'ó*. If it be even granted, that this royal title might be introduced from contiguous India, and in consequence of this not sufficient to decide of itself the relationship of the language upon the coins, yet, it serves as an indication of the mode we are to follow in interpreting the other titles.

13. The last syllable in Hermaios is  $\Phi\Lambda$  (As Trans Vol iv Pl. xxiv. No. 1;) upon No. 3, and No. 4, the *ó* occurs in an un-

\* As Trans iv 332

† As Trans v pl XLVI No 1

common form, which is perhaps only produced by the sharp accentuation. Thus ends likewise the name of Lysias, at the same place (As. Trans. Vol. iv. Pl. xxvi. No. 12. R. R. II. No. 8) Mr. Prinsep inferred, that  $\wedge$  was a j; Mr. Grotefend expresses it by i. But if we restore, according to Mr. Prinsep's striking remark, the upper line of the penultimate in the name of Diomedes, (As. Trans. Pl. xxxv. No. 3.) we shall have  $\text{𐤠𐤍𐤏𐤃}$ , in consequence *dayamidó*, for no body would be inclined to read *dauimidó*, and on the other hand, *dauimidó* must be written  $\text{𐤠𐤍𐤏𐤃𐤕}$ ,  $\wedge$  therefore is a consonant, and  $\text{𐤠𐤍𐤏𐤃}$  is to be read *hirmayó*. In the same manner  $\text{𐤠𐤍𐤏𐤃𐤕}$  must be accepted as *hsayó*.

Here I must however, remark, that we do not yet know whether  $\text{𐤠}$  be not rather written as the initial in Diomedes. Mr. Masson read  $\text{𐤠𐤍𐤏𐤃}$  at the end upon the coin of Archelaos, (As. Trans. Vol. iv. Pl. xxxv. No. 1) but the name upon the coin has become illegible. According to the same analogy we must rather expect *Lasyó*,  $\text{𐤠𐤍𐤏𐤃𐤕}$ , and here also we cannot come to conclusion, but by recommencing the investigation of the same coins, or by discovery of a new one.

From these corrected readings some peculiarities of the language become evident.

From *Hirmayó*, being substituted for Hermaios, it follows, that the language did not favour an open diphthong, as *ai*, and therefore changed the *i* into the affinitive semi-vowel j. It probably did likewise reject *au*, and it would have been rendered in *av*, if a vowel followed this diphthong.

From *Lasyó* and *Dayamidó* or *Lasyó* and *Dyamidó*, it follows, that this language was averse to admit the use of *i*, followed by a vowel, even if a consonant preceded the *i*; I use the expression "is averse to" this admission, for if the three first syllables in Antialkides are expressed by *atia*, this is probably done only in obedience to the order of a foreign king. So much at least is evident, that the language rejected the hiatus in *Lysias* and *Diomedes*; in what manner it was supplied, must be left at present undecided. However, the most obvious conjecture is, that a j was evolved from *i*. Thus the Sanscrit in *bhîé* resolves the long *i* into *u* whence *bhyé*, in *yarti*, *y* is derived from a

short *i* (*i-arti*) ; likewise, *ryati* from *ri-ati*      The Prâcît would admit the hiatus in *Lysias*, and *Diomedes*.

I shall yet add on the orthography of *hurmayô* the following remarks      We can find no affix to the *r* showing it to be *i* by itself, and not *ra*.      There is indeed no sign of pause, no *vrâma*, any more than is met with in the arrow-headed writing.      We must then also here decide on purely philological grounds, whether a consonant, having no other vowel sign, is to be read with a or without it.      The one peculiarity explains the other \*

Messrs Prinsep and Grotfend read, according to the Greek, the symbol  $\eta$  in *Azes* as *z*, and the symbol  $\Lambda$  in *Azilises* as *zi*      Mr Prinsep is inclined to admit also its denoting *g'* ( $\eta$ ), † but as we have found  $\mathfrak{z}$  as expressive of this letter, we cannot agree in this supposition      On the other hand, it is more difficult to decide, whether  $\Lambda$  be the representative of *z* (soft *s*) ‡ I observe, however, that *Azes* and *Azilises* are not originally Greek names      The Greek orthography may therefore exhibit itself as expressive of permutative pronunciation, and the principal question would be, what sound both kings gave those names in their own tongue ?      Though this be here mere matter of conjecture, yet, I think, I could maintain this one point, viz that the language, as related to the Sanscrit and Prâcît, had not the sibilant sound *z* of the Zend and old Persian languages, nor the French and Portuguese *j*, nor the Persian  $\mathfrak{z}$ , it must therefore denote such a sound by another letter.      A French *j*, very softly pronounced, may indeed sound to the ear as a *y*, on the other hand, *z* as well as the French *j*, proceed from *y*.      If then those Indo-Scythian names sounded as *Azes* and *Azilises*, the Greek representation of them would be, on the one hand, a most proper one, and on the other, that upon the coins, would serve as helping to give a proximate idea (of the sounds)

That  $\Lambda$  denotes *j*, is too much confirmed by the above mentioned Greek names, to be given up, and to adopt two different

\* In this somewhat obscure passage I understand Prof Lassen to mean, that the absence of the *vrâma* in the arrow-headed characters explains the similar peculiarity observable here —Trans

† As T IV 330

‡ Diez *Romanische Grammatik* I 220

sounds for the same symbol, is foreign to the character of those languages, which write in accordance with pronunciation, and which are hardly acquainted with *historical orthography*, as the French and English have now got it, (or the mode of writing words arbitrarily, and as not pronounced )

14 I will now observe succinctly on the s in the name of Lysias. In *As Trans.* Vol iv. Pl xxvi. No. 12, we find χ for s, the y which follows it, which M<sup>r</sup> Prinsep believed to be a t, is indistinct; so also upon the copy, *R R II.* 8: both representations by Mr. Masson (*As Tran* Vol III. Pl ix. No. 15 No. 6) furnish only a scrawl, at which however, nobody will much hesitate, with *R R I.* is distinctly the character ∇, there is here indeed no trace of an i, and we had to read *Lisayô*. M<sup>r</sup> Giotefend renders the y, by reading *Lisiô*, i. But I have already previously stated, that we must here expect an i, and we may indeed take the character in the *As. Trans.* so, as still to preserve the trace of that letter. For by comparing si in the name of Philoxenos, it appears, that in ∇ the i crosses the triangle, upon the coins, (*As Trans* Vol iv. Pl xxi. No. 1 and 2, a χ viz. si) twice before nô, the difference being, that in course of time the triangular character has taken an open form *R R II* No. 5, is well preserved, and has ∇. I therefore adopt also ∇ as the perfect character upon the coin of Lysias.

I must prove hereafter, that ∇ is probably a sh (sch.  $\nabla$  )

(*To be continued* )

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*Official correspondence on the attaching of Lightning Conductors to Powder Magazines. Communicated by permission of Government, by W B O'SHAUGHNESSY, Assistant Surgeon, Bengal Medical Service*

INTRODUCTORY NOTE

The great importance and difficulty of the question now under discussion, here and in Europe, regarding the attaching of Lightning Rods to Powder Magazines, led me to solicit the permission of Government for the publication of the following documents

Opportunities are so abundant in India for the investigation of such facts as may elucidate the difficulties still besetting this subject, that I should be deficient in all public feeling, did I hesitate in publishing this correspondence, although the high name of Mr Daniell is arrayed on the opposite side to that which I have taken

Mr Daniell conceives conductors to be at all times infallible in the protection they afford, and he would attach them *closely* to the Magazine I adduce facts on the other hand to shew, 1<sup>o</sup> that to derive perfect safety from this apparatus, we must use many more conductors than are generally directed, 2<sup>o</sup> that an inadequate number only increases the risk of a *direct* stroke of lightning, 3<sup>o</sup> that with any number, if placed *close* to the Magazine, although they carry off ALL the lightning to the ground, the Magazine may still be blown up, *by minute sparks* occurring among the powder barrels, by the disturbance of *their own electricity*, while the lightning is passing *outside* the building

Mr Faraday's opinion in all the essential points at issue, coincides with mine, and my lamented friend, James Prinsep, entertained exactly similar ideas to those advanced in my first report to the Military Board, in England, Mr Sturgeon and Mr Roberts take the same side in the discussion Our chief opponents are Messrs Daniell and Harris, and both these gentlemen, I know not why, have lost temper in the controversy This indiscretion I strive to avoid, through respect for my distinguished antagonists and for myself The question is one simply of facts, and the inferences seem sufficiently obvious, our sole object is to arrive at the truth, and this can only be reached by the temperate and patient investigation of all the circumstances before us

W. B O'S

3d August, 1810

(No 1.)

To DR. O'SHAUGHNESSY,

*Medical College.*

*Ordnance Department*

SIR,

The Military Board having been called upon by Government to report upon the expediency or otherwise of attaching lightning conductors to powder magazines, I have been instructed to address you on the subject, in the hope that your scientific knowledge may assist the Board in forming a correct opinion on that point.

2 Should the use of lightning conductors be considered by you desirable, the Board would feel obliged by any suggestions that you may be able to offer as to their height, position, size, and number for any given extent of horizontal or vertical surface.

3 The accompanying memorandum was received from the Court of Directors, and you are requested to return it with your reply

*Fort William,  
Military Board Office,  
22nd December, 1838*

I am Sir,

Your obedient servant,

W DEBUDE,

*Officiating Secretary Military Board.*

---

*(Memorandum)*

The higher a conductor is elevated, the more its efficacy will be increased.

Therefore for a powder magazine the conducting rod should be elevated seven feet at the least above the highest point of the building, should be placed standing out one foot from the building, and be made as continuous and direct as possible, branching out at the level of the ground, and carried underground in a dry brick drain six inches diameter, ten feet long, from thence carried down a hole filled with burnt charcoal, or ashes from the baker's oven

Copper rods pointed at top with platina are recommended

As the electric matter from violent storms causes intense heat, it is recommended to have the conducting rods one inch in diameter, which is a quarter of an inch more than they are usually made in England.

Strong wood brackets made of teak, or any other hard wood, to keep the conductors firm in their places.

There should be a conducting rod upon the principle here delineated at each end of the building

And as the direction of lightning is often determined by that of the rain, the surface on the side of the building might attract it, it would be prudent therefore to have a conducting rod on each side of the building as well as at the ends

The rods should be united with the best screwed joints, with a top screw of the same metal as the conductor.

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(No 2.)

FROM ASSISTANT SURGEON W B. O'SHAUGHNESSY, M.D  
To CAPT DEBUDE,  
*Officiating Secretary Military Board*

*Fort William, December 27th, 1838*

SIR,—I have the honor to acknowledge the receipt on the 24th instant of your letter of the 22d, on the subject of the attachment of lightning conductors to powder magazines

2. The question you propose is one of much difficulty. I doubt indeed, whether the existing state of knowledge regarding the reciprocal action of atmospherical and terrestrial electricity, especially during the paroxysms of tropical storms, is as yet sufficiently advanced to warrant the expression of more than a very diffident opinion on its several points.

3. I shall take the liberty of premising some general remarks on lightning conductors, before I take up the special subject of your letter.

4 I am in possession of several facts hitherto unrecorded, which seem to me clearly to show that in ordinary edifices the attachment of lightning conductors, even when properly



constructed, is by no means the infallible protection so generally imagined.

5 It is often no doubt easy to explain the occurrence of disasters by lightning to buildings thus apparently protected, on the ground of defective construction of the conductors, or of disproportion between the number of conductors and the extent of area to be guarded. By such considerations we may explain the accident to Government house on the night of the 30th of March 1838, and bearing these in mind, measures may be adopted which in all probability will preserve such edifices from similar visitations.

6 But it is a matter of greater difficulty to explain such circumstances I am now about to adduce, in illustration of the opinion expressed in paragraph 4.

7 On an evening in May 1837, the house No 2 in Chowlinghee, then occupied by Dr Goodeve, and next door to the house tenanted by Mr. Trower, was struck by lightning and much damaged.

Dr Goodeve's house had no conductor, Mr Trower's had one at the face adjoining Dr Goodeve's, and only distant therefrom twenty feet. The conductor is well constructed.

8. On the evening in question, during a violent storm from the North-west, Dr. Goodeve was walking in the verandah (*c*) when Mr. Trower's conductor and the corresponding angle of Dr. Goodeve's house were struck by the *same discharge*, and the lightning in Dr Goodeve's house followed the course of the vertical window bolts represented by the dotted lines in the plan.

9 This case seems to me completely to falsify Biot's opinion, that within sixty feet interval between conductors no accident can occur—and to shew that occasionally in tropical climates there is such vast disproportion between the quantity or intensity of the atmospheric electricity and the conducting capacity of protectors, that the excess of the discharge must pass to adjacent bodies

10 In Chowlinghee alone, in an area of one square mile, there are over 300 lightning conductors of proper construction,

yet scarcely a season passes but we hear of accidents within that area, and not unfrequently too in houses actually provided with conductors

11. I attribute these accidents chiefly to the vertical window rods which constitute all over Calcutta, as in Indian houses generally, a multitude of interrupted conductors, the inducing influence of which is sufficient to counteract much of the benefit of the well constructed rods. These vertical window rods are on a large scale, precisely identical with the models contrived by instrument makers to shew at the lecture table the dangers of ill-contrived and ill-applied conductors.

12. Were I called on to protect an isolated house of two stories, with angular edges and roof, containing articles of metallic furniture and other good conductors of electricity—under such circumstances I would attach at one angle a common conductor several feet higher than the house, in order to divert the lightning the house and its contents could scarcely fail, under many circumstances of exposure, to attract, and at each cardinal point I would place a rod about ten feet high, connected horizontally by thick rods and rivets with the main conductor.

A building so protected I would consider to be as safe as it is practicable to render it, according to the present state of our knowledge

13 But in the case of a powder magazine of the ordinary construction, rounded in outline, of trifling elevation, containing no metallic furniture,\* removed from other buildings, and not necessarily in the contiguity of conducting objects, I think its chances of being struck by lightning are very little more than those of an equal area of soil or terrace

14 We must remember that electric explosions are not chance occurrences,—that they are governed and guided by the influence of “induction,” the effects of which are now

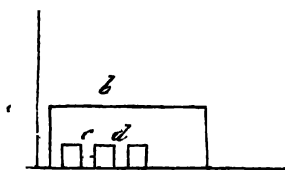
\* “Fittings” should have been the expression, but the word must now stand unaltered —W B O S

comparatively well understood ; that it is only between objects susceptible of rapid changes in their electric relations that the explosion passes, but that the explosion may exceed in quantity and in intensity the capabilities of the dischargers we usually adopt.

15. Another reason for objecting to the employment of conductors in the immediate contiguity of powder magazines is, the danger of their inducing what is called the “lateral discharge,” of the nature of which I will venture to offer a few explanatory remarks.

16. Suppose a violent discharge to take place along the conductor *a* to the ground, during the passage of the electricity an opposite electric state is induced in contiguous objects, and a spark may pass in the interval between *a* and *b*, and all the articles contained within having their electric state transitorily disturbed, *will give sparks at the same moment*,—if animate, will experience shocks or other effects in proportion to the violence of the primary discharge. Thus the inmates of Dr. Goodeve’s house suffered a shock like the discharge of the Leyden bottle, at the instant the accident took place, described at paragraph 8.

17. Were any peculiarly inflammable matter existing in the interval *a, b*, or in the interstices *c, d*, the passage of a spark would cause its inflammation, especially if rain were falling at the same time. The explosion of gunpowder by small electric sparks is indeed never certain, but when water or moist substances forms part of the electric circuit.



18. I will not enter on any detailed consideration of the dangers connected with what is called the “*return discharge*,” in which the electricity is believed to emanate from terrestrial objects, and proceed to the atmosphere. Precise facts are wanting to enable us to form exact opinions on this subject.

19. With respect to the materials and dimensions of conducting bars, I think it is altogether unnecessary either to construct them of copper, or to make them one inch in diameter.\* Iron can be preserved bright for an indefinite period by attaching to it small pieces of zinc, on the principle of the galvanic preservation of copper. If its point be gilt or platinized, the rod will on the contrary corrode much more rapidly than if entirely unprotected. As to size, I have known very many instances of violent discharges of lightning through window rods, through ill-constructed conductors, over picture frames, railings, through the metallic head of a spear with a wooden shaft, &c. &c. and in no case was complete fusion, or an approach to it, effected, except at the ends where the discharge entered, and from whence it proceeded. The drawing *a* shews the extremities of one of the window rods from Dr. Goodeve's house, and *b* of the spear of the Britannia from Government House, Calcutta.

20 As for the silent passage of atmospheric electricity causing the heat-



ing of conductors, I scarcely think it possible—certainly no instance of it has been recorded, and even were it to occur, it could not occasion any mischief

21 To apply the preceding facts to the question before me, I think it inexpedient to attach ordinary conductors, or such as those described in your letter, to powder magazines.

i. Because, being of slight elevation, of rounded surface, and of non-conducting materials, these buildings are scarcely more exposed to lightning than an equal area of ordinary ground

ii. Because a discharge may occur *too great for the capacity of a single conductor*, in which case the electricity will divide itself to all adjacent objects.

iii. Because though the discharge may pass to the ground, the lateral electric disturbance may occasion an explosion within the magazine.

\* That is where several conductors are employed as subsequently proposed —W B O'S

22 But as it may be deemed inexpedient to commit a magazine even to the chances of an equal area of land surface, I think a system of conductors on the following plan would prevent all danger of explosion by direct, or lateral, or even return discharge.

I would erect an iron rod, half an inch in diameter, protected by zinc, at every twenty paces, in a circle drawn round the building, and at least twenty feet\* distant from it. These rods should be twenty feet higher than the building, be supported by frames of wood or by pillars inserted at their bases, as deep as the water level (so easily found in Bengal), and at the surface of the ground they should be connected by horizontal rods secured by riveting. During storms the sentinels on duty should withdraw beyond this line, sheath their bayonets, and pile their arms.

I cannot conceive the possibility of an explosion caused by direct, lateral, or return discharge, taking place within this metallic circle. By such arrangements it is that the electrician discharges through a wire bird cage, without injury to its tenant, batteries sufficiently powerful to destroy a horse, and that he grasps the discharging rod in his naked hand while it is part of a circuit sufficient to cause his instantaneous death.

I have the honor to be,  
Your obedient servant,

*Medical College, Calcutta,  
27th Dec 1838*

W. B. O'SHAUGHNESSY,  
*Assistant Surgeon*

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(No 3.)

To W. B. O'SHAUGHNESSY, Esq. M. D.

*Medical College.*

*Ordnance Department*

SIR,—I am directed by the Military Board to acknowledge the receipt of your letter of the 31st ultimo, on the subject of *Lightning Conductors to Powder Magazines*; and to express the sense which the Board entertains of the care and attention with which the subject has been discussed.

\* This by an error of the copyist was made *paces* in the MS report —  
W. B. O'S

2 As in many instances it would, from the proximity of other buildings, be impracticable to establish a chain of conductors at a distance of twenty paces from a magazine, the Board would be glad to learn whether, in your opinion, a series of conductors at twenty paces distant from each other, but as near the building as ordinary conductors are commonly placed, and secured by wooden brackets, as shewn on the sketch forwarded by the Court of Directors, would add materially to the security of a magazine

Fort William,  
Military Board Office,  
16th January, 1839

I am, Sir,  
Your obedient servant,  
W DEBUDE,  
*Officiating Secretary Military Board*

(No 4)

TO CAPTAIN DEBUDE,

*Officiating Secretary Military Board*

SIR,—In reply to your letter of the 16th instant I have the honor to state, that under such circumstances as you describe, I would not recommend lightning conductors to be attached to the buildings adjacent to magazines even in the numbers before mentioned, as I feel convinced that placing one or more conductors in the immediate contiguity of the building increases all the dangers attendant on the *lateral* discharge. Indeed I would consider a magazine safer if unprovided with conductors altogether, than with any number placed as you allude to

I believe we may certainly obviate all danger from *direct* discharge by a multiplicity of connected conductors. I admit too that the *lateral* discharge is not likely to occasion more than a minute spark, such as would not harm a living animal, or injure an edifice, but this spark, however insignificant, can ignite gunpowder, and thus lead to as serious mischief as the direct flash itself

I have the honor to be, Sir,  
Your most obedient servant,

W. B. O'SHAUGHNESSY

January 20th, 1839

(No. 5)

MR FARADAY'S LETTER TO MR. SECRETARY MELVILL ON  
THE PRECEDING PAPERS.*Royal Institution, 5th September, 1839.*

SIR,—I have the honor to acknowledge your letter and the papers, and having read the latter, beg leave to state that my opinion is in favor of lightning conductors. It is no doubt true that low rounded buildings, such as I understand the powder magazines in the East Indies to be, are but very little liable to be struck by lightning, but then if they are struck, the destruction and injury may be very great. It is also, I think, very probable that a lightning conductor may, under *certain circumstances*, cause an electric discharge to take place where none would have occurred no conductor being present, though, on the other hand, there is some evidence to show that conductors cause a diminution in the number of electric discharges to the earth at a given place. It is also very certain that a badly erected conductor is worse than none, and may cause great injury. But notwithstanding these considerations, I have the strongest conviction in my mind that conductors *well applied* are perfect defenders of buildings from harm by lightning. Dr. O'Shaughnessy's papers are very valuable, and serve to confirm my previous impressions; but it would be impossible for me to go over the whole of the opinions and evidence sent me, without at the same time going into a far greater mass dispersed here and there. I would rather refer you at once to M. Arago's popular view of the subject in the *Annuaire* for 1838, pp. 221, 549, &c. with which I, in almost every point, agree

I would certainly recommend copper conductors instead of iron, for the former metal conducts electricity almost seven times better than the latter. When struck, it not only conducts the shock much better, but in the pre-determination of the stroke it determines more of the electricity to itself than otherwise would fall upon it, and therefore tends in any case of a divided shock to leave less to fall elsewhere in its neighbourhood.

I should prefer them pointed. I should not put them far from the building at their upper extremity, or in their course down-

wards, but the part that is under ground I should turn from the building in its course through the earth, and take especial care, by plates of copper, to make its contact with the moist earth extensive and good.

Conductors should be of a certain height in relation to the roof or summit of the building to be defended; a lightning rod rising ten feet above any part of the roof or chimneys of a house, might defend that house perfectly if close to it, but not if ten feet from it; a rod rising fifteen feet above the highest parts of the roof would be more sure than one of ten feet

A rod projecting ten feet which would protect a building of a certain horizontal extent might protect a building ten feet wide, &c A lightning rod has been considered as able to protect objects perfectly when they are not more than twice the distance *from it of its height above them* but for this to hold true, these objects should not be themselves parts of large masses of metal, approaching by their position or connexion to the character of bad lightning conductors

I have no fear of lateral discharge from a *well arranged* conductor. As far as I understand lateral discharge, it is always a discharge from the conductor itself, it might be very serious from a badly arranged conductor (and in fact makes them worse than nothing) but with a good lightning rod it can be but small, and then not to badly conducting matter, as wood or stone, but only to neighbouring masses of good conducting matter, as the metals, which either ought not to be there, or if they are necessarily present, ought to be in metallic communication with the lightning conductor itself I am not aware that lateral discharge can take place *within* a building when a lightning conductor outside is struck, except there be portions of metal, as bell wires, or bolts, &c which may form an interrupted conducting train from the conductor to the interior.\* It is true that cases which come under the denomination of returning stroke, might perhaps produce a spark in the interior of a building, but the phenomena of a returning stroke cannot occur at the place where the lightning strikes a conductor

\* Such as the copper linings of powder barrels in a magazine—W B O'S



In my opinion, a good conductor well connected with the earth cannot do harm to a building under its protection, i. e. *though it may induce a discharge on the building*, and the discharge in itself cannot give rise to any secondary effects which are likely to place the building in more danger than it would have been subject to, had the conductor not been there

I am, Sir,

Your obedient humble servant,

TO JAMES C MELVILL, ESQ  
&c &c &c

(Sgd ) WM FARADAY

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(No 6)

LETTER FROM PROFESSOR DANIELL TO MR MELVILL

*King's College, London, August 24, 1839*

MY DEAR SIR,—I have carefully perused and considered the papers which you have done me the honor to transmit to me, relating to the subject of lightning conductors in the East Indies, and now beg to submit for the consideration of the Chairman of the Court of Directors, according to your request, the following remarks upon them

2 It is with the greatest surprise, I have learnt that the question of the efficacy of lightning conductors, which has been considered by all the leading philosophers in Europe and America as settled by the uniform experience of nearly one hundred years, is still thought to be undetermined by some of the scientific men in the Honorable Company's Service; and that the Governor General and Council, under the influence of their opinion, have come to the conclusion, that in "attempting to protect Powder Magazines by their means more danger than advantage is likely to result from the measure." Should this conclusion be unfounded, as I believe all experience will prove it to be, it must be of the utmost consequence, that it should be corrected, especially in a country peculiarly liable to the paroxysms of tropical storms. That Powder Magazines unprovided with conductors are liable to be fired by lightning, is proved by the blowing up of the Magazine

at Dum-Dum,\* which gave rise to the correspondence, whereas there is no instance upon record of a magazine properly provided with them, suffering injury from the same cause

3. In the year 1823 instructions for the erection of lightning conductors were drawn up, at the instance of the Minister of the Interior of France, by a commission of the *Académie Royale des Sciences*, composed of MM Poisson, Lefevre, Ginian, Gerard, Dulong, Furet, and Gay Lussac, and adopted by the *Académie*. The Report is published in the 26th vol of the *Annales de Chimie et de Physique*.

4 So lately as the year 1837, the facts relating to thunder and lightning again underwent investigation by M Arago, who has published in the *Annuaire par le Bureau des Longitudes* for 1838 a very detailed scientific notice "*Sur le Tonnerre*"†

5. These two reports have really exhausted the subject, and ought to be sufficient, in my opinion, to convince the most prejudiced, first, of the impossibility of any extra danger arising from lightning conductors of proper construction, and, secondly, of the protection which they are competent to afford

6. I have lately had the honor of being appointed by the Government upon a Committee to inquire into the efficacy, and best form of lightning conductors for Her Majesty's Navy, and we have just handed in our report to the Admiralty, in which having collected a great body of evidence upon the subject, and having availed ourselves of the opinions of Doctor Faraday and Professor Wheatstone, we have unanimously recommended the general adoption of Harris's conductors on board Her Majesty's ships. The report has been ordered to be printed for the use of Parliament, and I will take the liberty of transmitting you a copy as soon as it is complete. In the mean time, I will endeavour to reply to some of the observations which Professor O'Shaughnessy has made in his report, which is included in the papers referred to me, and upon which, in conjunction with some pri-

\* The building destroyed at Dum-Dum was not a magazine, see the final report, No 7 ---W B O'S

† Arago's admirable paper had not reached India when I was referred to on this subject ---W B O'S

vate observations of Mr. (James) Prinsep, which do not appear, the Governor General's opinion seems to have been formed.

7. First, I infer from the general tendency of the observations of these gentlemen, that they entertain the notion that lightning conductors have the power of *attracting* a discharge of lightning to places where without them it would not occur.

8. Nothing can be more unfounded than this supposition. The intense action which takes place between an electric cloud, of the extent perhaps of many thousands of acres, and an equal area of the earth's surface, is much too extensive to be materially diverted by the mere point which can be directed upon the latter; and which, as compared with the extent and distance of the charged clouds, must be quite inconsiderable. The path of the discharge which takes place, in the form of lightning is determined by what may be the line of least resistance in the whole distance between the two great electrical surfaces, of which the conductor can form but a minute, fractional part.

9. Over this fractional part, however, we may have control sufficient for the protection required. It has been well and accurately observed, "that lightning conductors can no more be said to *attract* the matter of lightning, than a water course can be said to attract the water which necessarily flows through it at the time of heavy rain." It would be absurd to say that a hollow water-pipe open at its upper end, and placed perpendicularly, attracts or invites rain from the clouds, or that in providing our houses with such pipes, we incur a greater risk of being inundated, because they are calculated to discharge freely all the rain which passes into them. No less absurd is it to say that a metallic rod invites lightning, and may be productive of damage, because it is calculated to transmit the electricity which falls on its point.\*

10. Secondly, Dr. O'Shaughnessy refers to danger which is likely to occur from the erection of conductors in the contiguity of powder magazines from what is called "*lateral discharge*."

\* A pointed conductor will indeed draw off silently and safely a considerable portion of electricity from a charged cloud, but it can possess no power of determining a disruptive and destructive discharge at a point where it would not otherwise occur — *Mr. Daniell's note*

11. There can be no doubt, that a conductor in the moment of a discharge of electricity passing through it, influences in a degree, all good conducting substances in its immediate vicinity by induction; but no discharge will take place from it to any neighbouring body, unless it be insufficient itself to conduct the whole of the discharge; or unless the body in its vicinity be a better conductor than itself. A lateral discharge, in fact, is only a division of a portion of the principal discharge, from an insufficient conductor to another, which can relieve it. Now the very purpose of a lightning rod is to provide a sufficient conductor for the electric fluid which may fall upon it, and which will never pass from it, if properly constructed, to any building in its immediate vicinity, from the construction of which all metallic substances are, of course, carefully excluded.

12. Thirdly, Dr. O'Shaughnessy refers to Dr. Goodeve's house having been struck by lightning, within twenty feet of a well constructed conductor upon the house of Mr. Trower, which was struck at the same moment, as falsifying the opinion that within sixty feet interval between conductors no accident can occur; but in another part of his report he attributes this accident, doubtless very correctly, to the vertical window bolts, which he has marked upon his plan, and which constitute a line of interrupted conductors to the ground. There can be no question that the discharge was diverted in this instance; but it does not appear that any damage was done to either house; and if damage did occur to the unprotected house, it would have been doubtless greatly increased by the absence of the conductor upon Mr. Trower's house.

It would of course be an act of the greatest folly and ignorance to place a similar line of bolts, or any other metallic fastening upon a powder magazine.

13. The case by no means proves, as Dr. O'Shaughnessy seems to think, "that occasionally, in tropical climates, there is such a vast disproportion between the intensity and quantity of the atmospheric electricity, and the conducting capacity of protectors, that the excess of the discharge must pass to adjacent

bodies" *unless those adjacent bodies are also of a metallic nature, and themselves good conductors.\**

14. Dr. O'Shaughnessy states that "in Chowringhee alone, in an area of one square mile, there are over 300 lightning conductors of proper construction, yet scarcely a season passes, but we hear of accidents within that area, and not unfrequently, too, in houses actually provided with conductors themselves."

15 The electrical history of such a district must be extremely interesting, and it would greatly benefit science if authentic facts concerning it were collected, and published. It appears that Dr. O'Shaughnessy only mentions the facts upon hearsay, and such evidence is not of weight enough to counterbalance the direct testimony of competent witnesses, which abound on the other side of the question. I have no doubt that upon proper inquiry, Dr O'Shaughnessy would find that the accidents which are said to have occurred in houses actually provided with conductors, have arisen from defective construction.

16 It is not supposed that a large number of conductors will avert electrical discharges from a district, though, if properly constructed, they will open safe communication for their passage to the earth.

17. Dr. O'Shaughnessy thinks, that "it is altogether unnecessary either to construct lightning conductors of copper, or to make them one inch in diameter," but in this opinion I have again the misfortune to differ from that gentleman. The best authorities have recommended a rod of an inch in diameter as the standard size, experience having proved that such a rod has never yet been melted by an atmospheric discharge. It is certainly possible that a rod of less substance might be sufficient to conduct away a flash of lightning, but it is impossible to ascertain the minimum which would suffice, without incurring the

\* I must refer the reader to the succeeding paper, for proof of the error into which Mr Daniell has here fallen ---W B O S

risk of failure ; and it is a point of very little importance, provided absolute protection be assured.\*

Moreover a rod of a less diameter would scarcely have sufficient strength to resist the mechanical forces which might be opposed to it.

18. The rod should be of copper, first, because the conducting power of that metal is very much superior to that of iron, being in the proportion of 1000 to 158. And, secondly, it is little liable to oxidation and corrosion I do not think that the application of zinc to iron rods, in the way proposed by Dr. O'Shaughnessy, would be, by any means, efficient in keeping them bright, at the same time I would rather erect iron conductors, than run the risk of a total want of protection.

19. I have no objection to make the disposition of the conductors proposed by Dr. O'Shaughnessy, but I see no reason for placing them at so great a distance as twenty paces from the magazine. The most material points to be attended to, are their perfect metallic continuity, and their communication with the water of the subsoil. The instructions for the erection of lightning conductors are so minutely detailed in the two reports to which I have already referred, that I think it unnecessary to add any thing more at present, but it will give me the greatest pleasure to afford any further explanations in my power that may be required.

I cannot conclude, without again expressing my strong conviction of the necessity of procuring a revision of the opinion of the Governor in Council upon the subject in question with as little delay as possible.

I have the honor to be, &c.

(Signed) J. F. DANIELL.

TO PHILIP MELVILL, Esq.

&c.      &c.      &c.

\* I did not allude to a single conductor, but to a set of several combined.  
---W B O'S

(No. 7.)

SECOND REPORT FROM DR. O'SHAUGHNESSY TO THE MILITARY BOARD.

TO CAPTAIN DEBUDE,

*Secretary to the Military Board.*

SIR,—In compliance with your request that I should draw up a further statement of my opinions regarding the attachment of conductors to powder magazines, I have the honor to submit the subjoined observations to the consideration of the Military Board.

2. I regret much, that it is impracticable to accord to me the full measure of time desirable for the collection and accurate examination of the numerous facts bearing on the question now before us, to which I have obtained a clue, and many of which corroborate powerfully the views I entertain. I regret this the more, as I have the misfortune to differ in a slight degree with the opinions Mr. Faraday has given, while those which Mr. Daniell somewhat dictatorially professes, are widely at variance with mine.

3. I trust I may be pardoned by the Military Board for here publicly placing on record a tribute of my deep respect for Mr. Faraday's labors in electrical science. This department of physics he has made peculiarly his own. My presumption would be measureless were I to depart from the utmost modesty and hesitation, when I venture to persevere in an opinion, from which he ever so slightly dissents. I seek however for no more candid a judge than this illustrious philosopher, and on once more referring the subject to his consideration, I will bow to his contrary decision, with the full conviction that I had acted upon erroneous views.

4. Mr. Daniell's facts and arguments will be treated *ad valorem* in the subsequent observations. I have only to observe, that in the further discussion of this question, it would be well if he would condescend to use a more courteous tone, and to

recollect that his opinions, as well as mine, have to bear the scrutiny of individuals who are not very likely to be influenced by the mere reputation of any of the parties concerned.

5. The question before the Board, is this exclusively, "Are we to attach lightning rods to *powder magazines* : and if so, how are we to place them, so as to ensure the maximum of safety from every accident?" To this question and its bearings, we must limit this discussion. It is altogether a different matter from that with which Mr. Daniell has mixed it up, namely, the attaching of conductors to private dwellings, or ordinary buildings. All the circumstances differ so widely, that many of the most important of the facts and arguments which bear on one, are altogether inapplicable to the other.

6. The necessity for attaching lightning rods to powder magazines in tropical regions, visited by frequent and violent thunder storms, might at first sight appear so obvious, as to need no further consideration. The document (A) however shews, that of all the magazines in the territories of the Honorable East India Company, during a period of forty years, only one has been struck by lightning, namely that at Dum-Dum, on the 1st of June 1836. It will be seen, as we proceed, that the term "magazine" was scarcely applicable to the building then destroyed.

7. I stated in my first report on this subject, that I considered a powder magazine *when properly constructed*, arched and rounded in its outlines, of low elevation, and free from metallic masses in its walls and roof, to be as little exposed to accident as an equal area of soil or terrace, the chances of which being struck by lightning are so infinitely small, as scarcely to deserve serious consideration. The Dum-Dum explosion took place in a common building of square form, formerly a godown. It was not a magazine, but a mere store-room for the powder used for the laboratory. It stood in the corner of a yard crowded with guns, gun carriages, heavy metal tools, shells, and other powerful conductors of electricity. It



was exactly what it ought not to have been, and the explosion which occurred, by no means invalidates the position, that the well constructed magazine has but an infinitely small chance of being struck by lightning.

8. The questions now arise—*First*, Would even this minute contingency be obviated thoroughly by a lightning conductor being attached to the magazine, on the method advised by the Honorable the Court of Directors? *Secondly*, Can the conductor itself by possibility become a source of collateral danger?

9. I will take up each of these questions in detail. I grant in the first place, as the foundation of the argument, that metallic conductors have the power, when properly placed, of *SILENTLY* drawing off *considerable* accumulations of electricity from the clouds, and, secondly, of guiding away to the earth *considerable* direct *explosive* discharges or *flashes of lightning*, without permitting the electric matter, whatever it be, to impinge *directly* on any adjacent bodies.

10. The extent to which the protecting influence of a conductor extends laterally, has long been a subject of attention and discussion. Leroy, in 1783, asserted that a rod four to five metres high, above the roof of an ordinary building, defended a circle of sixteen metres radius, or more than three times the distance of its own elevation above the roof.

11. The Academy of Sciences in 1823, in a report to the Minister of War, adopted the opinion of M. Charles, that the circle protected was of a radius double the total elevation of the conductor *above the roof*. This opinion seems to have been generally adopted, but must be modified in consideration of the facts which M. Arago has collected, and some which have come under my own observation.

12. If masses of metal of any kind enter into the construction of a building, the protecting influence does not extend to the distance above mentioned. The powder magazine of *Purfleet*, provided with a conductor erected by Franklin and Cavendish, was struck by lightning twenty-four feet from the

nearest part of the conductor, which was twenty-six feet above the roof—the distance being less than the simple height. The parts struck contained a metallic cramp.

13. Dr. Winthorp, of New Cambridge, reports, that a tree was struck by lightning, when but fifty feet from a conductor attached to the steeple of a church, which may reasonably be supposed to have been at least fifty feet higher than the tree.\*

14. All that we are entitled to infer from the facts before us, is—that in order to give safety from direct and *ordinary* discharges, we must erect so many conductors, that no point of the roof shall be further from the conductor than twice the length of the height of the conductor above the level of the roofs, and this applies only to flashes from clouds in a *calm* atmosphere, and *above* the building. The area of protection is unquestionably much contracted, under the circumstances, so common in India, of a thunder cloud being blown with hurricane velocity across a plain, before a furious squall. Nothing but a line or chain of conductors connected together by horizontal metal bars, and surrounding a building, can possibly protect it from discharge under these paroxysmal storms. This is the opinion I offered in my first report, dated the 27th December 1838, and I have now but to repeat, that one or even two conductors are not an adequate protection, and to *ensure* safety, several must be erected. The subsequent considerations will probably bear me out in repeating, that a properly built magazine, with but one, or any inadequate number of conductors, is in greater danger of explosion, than if it had none, and that with ever so many conductors, these should be placed at a considerable distance from its walls.

15. I proceed now in the attempt to sustain my opinion, that “A magazine with but one, or any inadequate number of conductors, is in greater danger than if it had none.”

\* For details regarding the case, see *Annuaire* for 1838

16. The cause of a lightning discharge selecting the conductor is to be traced in the law of electrical induction, which I hope to be pardoned for briefly exposing.

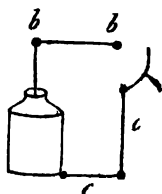
A cloud highly charged with electricity of either kind (let us say, *positive*) approaches the earth, and by the approximation causes the natural electricities of the earth to separate, and that of the *negative* kind to accumulate at the surface opposite to the cloud. The intervening particles of air are thrown into a polar state. The cloud is attracted by the earth, the electricity of which becomes most accumulated on the buildings and objects on its surface, in proportion to their degree of conducting power. At length the resistance to the rushing together of the two opposite electricities is overcome, and a discharge by explosion takes place, the best conductor on the earth receiving all the electric discharge it is capable of conducting *in the time* the discharge occupies. Of all such bodies a pointed metallic rod is the most likely to receive a discharge, and will lead off the greatest quantity thereof to the earth.

17. Mr. Daniell has indeed stated, that a pointed bar must cause a silent discharge without explosion.\* I am unable to comprehend how Mr. Daniell could have fallen into such a misconception. The whole history of lightning accidents, teems with instances of well constructed *pointed* rods having been struck, and the points melted. Look at the accident to Mr Trower's house for example.† The conductor is faultless in its construction, and the *flash was seen to strike it* by Dr. Goodeve.

\* "*A pointed conductor will indeed draw off silently and safely, a considerable portion of electricity from a charged cloud, but it can possess no power of determining a disruptive, and destructive discharge, at a point where it would not otherwise occur*" *Mr Daniell's paper.* See para 9

† Described in my first report.—W. B. O'S.

But let Mr. Daniell try this simple experiment. Let *a* be a Leyden jar, *b* a rod and ball connected with the inner coating, *c c* a rod and ball connected with the outer coating, *b* represents the excited cloud, *c c* the excited surface of the earth. To the ball of *c* apply one branch of a *pointed* discharging rod, and then **RAPIDLY approach** the other *point* to the ball *b*. A hiss is heard for an instant



and a loud explosion then ensues. If the point had been brought *very slowly* towards the ball *b*, there would have been nothing more than a silent, or at most a hissing, discharge. Mr. Daniell will perhaps admit that it is the same thing, that the earth carrying the conductor should approach to the cloud, or the cloud approach to the earth; and he will see in this experiment that it is simply the degree of velocity of the approach that governs the nature of the discharge. The electric cloud in a calm atmosphere will give off a constant and quiet stream to the rod—but let the cloud be driven onwards before the wind, or drawn within the vortex of mechanical electrical attraction, and then **EXPLOSION will inevitably ensue.**

18. So much for the cause and nature of the direct lightning flash to a *single pointed conductor*. Let me beg the Board to honour me with their attention to this distinction, as it is essential that no misconception should arise.

19. An *explosion* then, it must be admitted, may occur to a *pointed* conductor. I have next to shew that this explosion, or the flash, or the amount of the electricity passing (which I use as convertible terms) may be so much greater in quantity than the single conductor can convey *in the time* of the discharge, that a considerable part, nay, the whole of the excess, must pass to the adjacent objects. To make my meaning clearer;—Let us suppose the cloud to be charged with 1000 parts of active electric matter—let us *assume* the conducting

power of a lightning rod to be equal to 250 in a unit of time, I believe that the 750 parts in excess, will *in the same unit* or instant, pass off in *every direction* to surrounding objects, striking those which offer it the best conducting path.

20. In proof of this assertion, I refer to the accident to Dr. Goodeve's house, which I have already reported. Dr. Goodeve's house is twenty feet from Mr. Trower's. Dr. Goodeve while walking in his verandah *saw* the lightning strike Mr. Trower's conductor, and at the same moment strike his own house, taking, as might be anticipated, the window bolts, and other metallic bars in its course.

21. Let me cite another and a most important fact from M. Arago's rich collection. The house of Mr. Raven in Carolina was provided with a conductor formed of an iron bar, fixed in the roof—a brass wire outside the wall thence led to another metal bar planted in the earth. The conductor was struck by lightning, the wire was melted as far as the ground floor—the lightning then pierced the masonry of the wall at a right angle, exactly where a gun was standing against the wall in the kitchen, the barrel was struck, but uninjured, the stock broken, and thence the electric matter passed to the ground.

22. Here we have clearly lateral deviation from a conductor, *and the excess passing to the nearest conducting object.* The wire was disproportionately small for the quantity of the discharge; it was fused, and the excess passed to the adjacent conductor. It will be objected, that this would not have happened, had the lightning rod, or wire, been of the ordinary dimensions, that the conductor could not have been fused, and the lightning could not have left it. In reply, I point once more to Dr. Goodeve's house. Mr. Trower's conductor was not melted, and yet Dr. Goodeve's house was simultaneously struck.

23. Look to another fact, cited by Arago. A French vessel of war, *La Junon*, was running before a brisk gale. A copper conductor of twisted wires led from the main-mast head to

windward, and was secured by copper strips to the ship's side. A flash strikes the top, and a flash is seen by all on board, at the same instant, to leave the conductor about on a level with the cap of the main-mast, and to dart into the water over the *lee* bulwarks. This is a clear instance of an excess of electricity leaving a conductor through which it cannot force an instantaneous passage. All that the conductor could convey was borne off to windward—the rest opened to itself another and less difficult route.

24 It might here be the most appropriate place to discuss the question, What is the greatest mass of metal a flash of lightning can fuse?—When we remember that the surface of a cylinder increases by a simple multiple of the diameter, while the mass increases as the cube—that every fact shews it to be the *surface* which the electricity pursues,\* while its calorific effect must be in the inverse proportion to the mass—it will probably seem that the surface may be too small to convey a given quantity of electricity, although this be insufficient to melt or even to heat the *whole mass* of the metal.

25. Mr. Daniell, in reference to the efficacy of single conductors, enters on the much disputed question, as to whether these *attract* lightning, or are merely passive conductors for its conveyance. He takes the latter view, declares the former to be *absurd*,† and compares the conductor to a water-

\* Mr Harris, a high authority on electricity, makes these remarks respecting the surface action of conductors —

“The conducting power of a metallic rod has but little relation to its solid contents, but is principally dependent on its surface, from which cause the mere gilding of a ball of wood is found to conduct a proportionate electrical discharge with the same facility as if the ball was a solid mass of metal, hence a less quantity of metal formed into a hollow tube would be as a conductor, even more effectual than a solid rod of the same diameter, because its superficies would be increased” *Harris on Electrical Conductors*, p 31

† The Board are referred to the marginal note at para 17, for Mr Daniell's own admission, that pointed conductors “draw off” a considerable portion of electricity, &c &c *Drawing off* and “*attracting*” are very like synonymous terms.—W. B O'S

course, a favorite illustration of his as it occurs in more than one part of his published writings. Practically, it is but of little consequence whether the conductor be active or passive; but of all the substances excited at the moment—engaged in the vast induction we have described—of the cloud, the air, the earth, and the things on its surface—the lightning rod is that in which the induction is the most powerful, and towards which the explosion is therefore the most likely to occur. Call it passive, if Mr. Daniell so pleases, but the electric fluid is more active in it than any where else. The discharge takes place;—the first instalment, or the head of the column rushing to the point of the conductor, heats the air through which it passes—rarifies it, and diminishes the resistance to the outpouring of the rest of the electric accumulation. The excess, unable *in a unit of time* to pass over the bar, rushes to surrounding objects.\* Did it occur to Mr. Daniell that no prudent man builds his house by preference on the bank of a mountain water-course? The water-course is doubtless *passive*, and it will quietly and silently carry off the stream of an ordinary

\* The Board are requested to consider *Mr Faraday's* opinion on this point —

"The fact however is, that disruptive discharge is favorable to itself It is at the outset a case of tottering equilibrium, and if time be an element in the discharge, in however minute a proportion, then *the commencement of the act at any point favors its continuance* and INCREASE, and portions of power will be discharged *by a course which otherwise they would not have taken*

"The mere heating and expansion of the air itself by the first portion of electricity which passes, must have a great influence in producing this result

"As to the result itself, we see its effect in every electric spark, for it is not the whole quantity which passes that determines the discharge, but merely that small portion of force which brings the deciding molecule up to its maximum tension, then when its forces are subverted, and discharge begins, *all the rest passes by the same course* from the influence of the favoring circumstances just referred to, and whether it be the electricity on a square inch or a thousand square inches of charged class, the discharge is complete Hereafter we shall find the influences of this effect in the formation of brushes, and it is not impossible that we may trace it producing the jagged spark, and forked lightning " *Faraday's Experimental Researches*, p 451 para 14, 17--20

shower; but the rains may sometimes fall in excess, the stream swell to a torrent. As the waters require a *given time* for the efflux of a certain quantity, the excess inundates the bank, and the house is overwhelmed. The parallel seems to me to be complete, although Mr. Daniell's ingenuity may probably succeed in placing the question in a different, and less intelligible light.

26. With very great respect for Mr. Daniell's acquirements, I cannot help wishing he had the opportunity of increasing his practical knowledge, by observing a tropical storm. Had he seen the whole horizon one dense mass of electric clouds—had he heard crash after crash, a hundred times repeated, like the broadside of a line-of-battle ship—had he seen the lightning strike (as I have) three times within a few seconds, and not a hundred feet from my house—had he been in a storm in which thirty-one persons perished,—he would very probably participate in my idea, that electrical accumulation very commonly surpasses the conveying power of ordinary conductors, and remembering that “when discharge begins, all the rest passes by the same course” (see Faraday's note, p. 302)—the consequence might be as apparent to his mind as to mine, that the excess must pass to the most adjacent objects, selecting among these the best conducting materials.

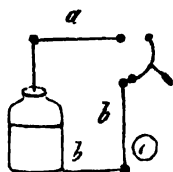
27. These facts appear to me sufficient to warrant my opinion, that there is more danger in giving one conductor to a magazine than in leaving it unprovided altogether. It appears to me, further, as I have already stated, that even from any number of conductors there is another source of danger in what I term the *lateral discharge*, unless the conductors be placed at a considerable distance from the magazine.

28. As much controversy has arisen regarding this lateral discharge, I wish to explain clearly the meaning I attach to the term. If this be patiently considered, I think it will be found that it is more about the fitness of words, than the nature of the facts, that the difference of opinion exists.



29. I select an experiment with the Leyden bottle to exemplify my statement.

Let *a*, be a ball and wire connected with the inner coating, *b b* with the outer coating of a charged bottle—let *c* be a metallic ball placed near, but not touching the rod *b*; when the discharge is made by bringing *a* and *b* into contact, by means of the moveable rod *d*, as the electricity passes through the rod *b* a spark takes place between it and the ball *c*, although the ball *c* is out of the direct circuit.



30. This spark all electricians have seen ; its existence *is universally admitted*. The ball *c* may be connected with the ground, or with a long wire, and the spark will still pass. If the ball be connected with a wire, and the opposite end of the wire with the apparatus called “Volta’s cannon,” charged with inflammable air, *at the INSTANT* of connecting the outer and inner coatings or discharging the jar, the cannon is exploded also. Gunpowder, spirits, and other inflammable matters may be fired by this spark, although it is manifestly far *out of the course of the MAIN discharge*.

31. There have been several attempts to explain the occurrence of this spark. The older electricians, and Henry of New York, regard it as the effect of induction in the bodies adjacent to the main conductor ; that it is not a direct emanation of electricity from the conductor to the lateral objects. Mr. Daniell says it is only the *EXCESS* from an *insufficient conductor* which passes to the adjacent object. This idea any one possessed of a Leyden jar and a few pieces of wire may set aside by a simple experiment, when he will find the success of each attempt at obtaining the lateral spark increased by increasing the mass of the *prime conductor*. Mr. Faraday however supposes this extra spark to be a direct expansion of the electricity—that with a good lightning rod it can be but small,

and then not to badly conducting matter, as wood or stone, but only to neighbouring masses of good conducting matter, as the metals, which either ought not to be there, or if there, be in metallic connexion with the conductor. It is on this point that an apparent difference exists between Mr. Faraday's opinions and mine.

32. It is however always easy to obtain this spark to the knuckle, and to many other imperfect conductors. Further, the spark now alluded to, whatever be its cause or nature, may be expected to increase in power in direct proportion to the quantity of electricity in the original flash. If with a quart Leyden jar we can procure, as I have repeatedly done, a secondary or lateral spark half an inch long, capable of inflaming gases and gunpowder, I think I am not straining the inference too far, when I believe that the discharge of 10,000 acres of excited cloud may cause a secondary spark or flash capable of passing through the wall of a magazine and exploding its contents. Mr Harris has indeed recently asserted that increasing the primary spark does not increase the secondary one, but I must state, with every respect to this gentleman, that I have repeatedly exhibited to my classes, long before his paper was published, the experiment described at para. 30—and that I have often shewn, that while success is uncertain with a small jar, it is infallible with a large one. I had not the means of measuring the spark, but its increase was plainly visible, and palpable, as we increased the battery and its charge. The magazine, moreover, contains powder barrels lined with copper, and even though no flash or spark pass *through* the wall, the barrels themselves may give sparks to each other under the influence of the electricity passing *outside*. Mr. Faraday has shewn in one of the most perfect of all his matchless researches, that without the direct conveyance of electricity, the *walls* of an apartment in which a common electrifying machine is worked, are in a state of active electrical excitement.

33. Mr. Harris, who is doubtless a highly accomplished elec-

trician, has recently published some views regarding this spark, which require a cursory notice. Mr. Harris, when ten years ago he proposed his system of ship conductors, was either unaware of the occurrence of this spark, or held it in such little respect that he actually led one of his conductors *through* the after powder magazine, and he has recently induced the Lords of the Admiralty to order this system to be adopted through the navy.

34. Mr. Harris admits the *existence* of the lateral spark, but attributes it to what is commonly called the "residual charge." Thus after discharging a battery, it is well known that a small secondary charge collects, and will give a spark or shock to any conductor touching both the coatings.

35. I repeat, that it is but little consequence what the *cause* or *nature* of the spark in question be. It is its *existence only* that should influence this question. But if Mr. Harris will repeat the experiment described at para. 30, he will find the explosion of the cannon to occur *at the very same instant of time* as the discharge of the jar, and that *after this*, he will still succeed in obtaining the residual discharge on contact of the inner and outer coatings.

36. The accident which befel Her Majesty's ship Rodney last year in the Mediterranean, shows the occurrence of the lateral, or extra discharge in a form which scarcely admits of mistake; the flash struck the main-top-gallant mast, and escaped from the mast seven feet above the deck, and was seen by all on deck to go over the lee-nettings, and strike the sea a short distance from the ship.

*Sparks were seen by many of the officers between decks*, and many of the men declared they saw balls of fire on the lower deck, and ran after them to throw them out.

Here is another instance of lateral or indirect effect. At the moment Dr. Goodeve's house was struck, Mr. Hutchins sitting in a room on the ground floor, several feet from the course of the lightning, received a severe shock. Whatever produces

a shock will in greater quantity cause a spark, and if the spark be but the tenth of an inch in length, it can inflame powder, which is the great matter we have to guard against

37. In connexion with this subject M. Arago gives us some very useful hints.

A few detached sentences may be quoted to shew M. Arago's ideas —“ Lightning once engaged in a metallic bar of sufficient dimensions, and well constructed, does not quit it to strike the materials of which buildings are usually constructed, but in SUCH SMALL QUANTITY that *no injury can arise*, nor even any appreciable effect.”

38. M Arago is here writing of ordinary buildings. But what would produce no appreciable effect on these, would cause the explosion of a magazine

39. M Arago proceeds to ask, “ Should conductors be placed within, or external to, buildings ?” The Board will see how this bears on Mr Harris' ship conductors, which *run THROUGH the after magazine* “ I confess,” says M. Arago, “ that on this point I would be much less affirmative Voltaire used to say, ‘ there are some great lords not to be approached without extreme precaution, and lightning is one of them.’ I think the illustrious author is perfectly right, especially when I recollect the case of Mr. Raven's house, already alluded to. Doubtless the conductor was not sufficiently thick, but here is an occurrence in which all was apparently in good order, the conductors acting as well as could be desired, and nevertheless there was a deviation of the electric matter. \* \* \*

“ The 31st July 1829, in the Jail of Charlestown, at the moment of an immense thunder clap, 300 persons received a violent shock, the effects of which lasted for some seconds. \* \*

“ The jail had three good conductors, eighteen feet apart, the building was untouched by the lightning.” \* \* \* (See the *Annuaire* for 1838).

40. How did the inmates receive this shock ? M. Arago refers it to the large quantity of iron the building contained.

Can I be accused of exaggeration, when I express my belief, that the same cause, which independently of direct discharge occasioned the shocks here alluded to, might in a magazine of powder barrels be sufficient to occasion minute sparks, and the consequences to which these will naturally lead ?

41. Lastly, M. Arago alludes to the proposition of Toaldo, sanctioned by the Academy of Science, that for powder magazines, the conductor should be placed at two or three metres from the walls, on vertical masts. He approves of the idea in principle, but describes its practical application as too expensive, owing to the number of conductors which would be required.

42. But there is one most important experiment by Prof. Henry, of New York, to which I earnestly invite the attention of the Board. I wish my humble voice could reach the Lords of the Admiralty with effect, and that by an appeal to the good sense of men, who have only public interests at heart, and who have no previous scientific doctrines to combat for, that I could induce them to pause before they provide the British Navy with the dangerous conductors Mr. Harris has led them to adopt. Professor Henry led a copper wire, forty feet long, from the prime conductor of an electrifying machine, into a deep well full of water. On working the machine, from every part of this wire large sparks were obtained, and a voltaic cannon was fired by one of these sparks close to the surface of the water. Nay, more, Professor Henry repeated this experiment on a lightning conductor attached to his house, and properly constructed in every way. From every part of the conductor sparks were given off.

43. But even in the paper by Mr. Faraday, I find ample admission of many of the facts I have contended for. "It is no doubt true, that low rounded buildings, such as I understand powder magazines to be in India, are but little liable to be struck by lightning." "It is also I think very probable that a lightning conductor may, under certain circumstances, cause an electric discharge to take place, where none would have occurred, no conductor being present."

44. Let us hear what Mr. Daniell himself is candid enough to allow. (See para. 11 of his report).

“ There can be no doubt that a conductor in the moment of a discharge of electricity passing through it, influences in a degree all good conducting substances in its immediate vicinity, by induction, but no discharge will take place from it to any neighbouring body, *unless it be* INSUFFICIENT ITSELF to conduct the whole of the charge.” \* \* \*

45. To this I have only to add, that since my first report (Dec. 1838), in a paper published by Mr. Sturgeon in the *Annals of Electricity* for October 1839, precisely the same ideas as those I entertain are fully and ably advanced. Mr. Martyn Roberts, a well known electrician, advocates the same views—such also were the opinions of my admired and esteemed friend James Prinsep, whose name alone is full proof, to the Indian community at least, of the sterling value of the conclusions he arrived at.

46. From the consideration of all these facts and reasons, I think myself justified fully in adhering to the opinions expressed in my first report. I do not, and never did, deny the protecting power of well constructed conductors erected in a given number. I stated distinctly all the circumstances from which danger might result, and how I conceived these might best be avoided. I freely admit copper to be superior to iron, but I wished to avoid expense in introducing the system I proposed. On that system I conceive all danger would be obviated, while in the method proposed in the letter from the Honorable Court at least two highly probable causes of accident remain in full operation.

47. Having obtained through your Board the sanction of Government to the publication of the papers by Messrs. Faraday and Daniell, I will take care that the views therein contained shall be generally made known. In an early number of the *Journal of the Asiatic Society*, I propose further to print an abstract translation of M. Arago's remarkable Essay “*Sur le Tonnerre*” which I saw for the first time when it was sent to your Board, along with Messrs. Faraday and Daniell's papers. The interesting facts with which M. Arago's memoir abounds, will doubtless lead many competent observers to study the phenomena and effects of lightning on the grand scale in which these may be witnessed in India. A multitude

of facts will doubtless be thus quickly accumulated, and from these we may reasonably hope to found certain opinions on the points still open to doubt and discussion.

48. The electrical history of Chowringhee I will take care to collect for Mr. Daniell's gratification, with the precision he is good enough to recommend me to observe. I only regret that this is not the appropriate place for noticing the very courteous remark he has made upon this topic

49. I designedly forbear from all observations on the attachment of conductors to *ordinary* edifices, whether private or public. No one is more convinced of their value than I am, but I am at the same time as satisfied that as they are usually constructed they are sources rather of danger than of protection, referring therefore, with great respect, to my first report, I can only modify the suggestions therein given to the extent, that I believe six to ten feet interval between the walls of the magazine and the conductor will suffice, instead of the more considerable space I first recommended. With this sole exception, I am deeply impressed with the belief that it were wiser to commit our magazines to the same chances through which they have passed unharmed for the last half century, than expose them to the possible dangers I have described to proceed from the attachment, in the ordinary manner, of an inadequate number of conductors erected at but one foot from their walls.

50. To economize materials, it would be advisable to erect a wall as high as the roof of the magazine, ten feet distant from it all round. At each corner of this wall a conductor twenty feet higher than the roof should be placed, and properly led to the ground as deep as the water level. Between these conductors, at every ten or fifteen feet, I would place a pointed bar six feet long, inclining outward at an angle of  $45^{\circ}$ ; all these bars should be connected at their bases by a broad strip of sheet copper led along the wall.

I have the honor to be, Sir,

Your most obedient servant,

W. B. O'SHAUGHNESSY, M. D.

*Asst Surgeon and Prof Med. Col Calcutta*

*Medical College, 22d June, 1840.*

*Second Paper on a march between Mhow and Sagur By KHAN ALI.*  
*On the Huli in Malwa*

The traveller in India can never be without something to interest him, so little do we know of the country, and of its inhabitants, —thus, when no antiquities were at hand, we amused ourselves by attending the different ceremonies of the Huli, which was playing all round us

The Huli usually to be seen in our well regulated cantonments, or the towns of our Provinces, attracts but little attention, the leisure rendered so interesting by its classical associations, being repressed by order and decorum, while dirty water thrown about, constitutes nearly all the fun, and the bon-fires are but a scanty collection of faggots, hardly sufficient to warm one's hands by The festival to be appreciated must be witnessed in all its native rudeness in the towns and villages still ruled by Hindoos, far removed from Mussulman prejudice and European police (1)

In the villages in this neighbourhood, for instance, there is one grand general bon-fire, (2) which sometimes rises to a height, beside which an Eton 5th of November one would look dwarfish The first stick is planted on the 5th Sudi of Magh (3) The potail, the village priest, the boys and the idlers, assemble round the well known spot set apart for the purpose, and the ground having been swept and sprinkled with

1 It was at first intended to note only such peculiarities of practice as we might observe in the celebration of the Huli in this part of India, but it was found impossible, in many cases, to separate local from general customs, and my remarks have thus swelled into an essay, which though perhaps misplaced here, is allowed to remain, as I am not aware of any detailed account of this festival in English, but you are at liberty to omit the description, should any such have been published The customs more peculiar to this neighbourhood, are pointed out in the text

2 In towns each muhal has its own bon-fire

3 Improperly, the full of the moon being the orthodox time This advance of ten days is very unusual in our provinces, and is by no means general even here The 5th, however, the first day of Bussunt is, every where, one of much sanctity, pooja is said to Krishna and Rukmini, to Camdeo and his wife Ruti, and it is proper to feast Brahmuns, the family priest, and friends The whole month of Magh, indeed, is esteemed by the Vishnooes holy, above all other months, and serves as an introduction to the gaieties of the Huli, in memory of Krishna's sports at this season of his minstrelsey "which delighted bees, birds, and deer," and "drew down the rude applause of the Gopis and Gopas," and to his refreshing himself in the Jumna after his fatigues Laughing and singing, and clapping of hands, and bathing should be the principal occupation of the month The last is the most important duty it should commence from the 11th Sudi of Pous, and continue to the end of Magh, and if regularly performed, (when half the rising sun's disk appears above the horizon,) washes away (according to the Pudum Puran) all sins



water, the poojari proceeds to hallow it, with certain holy mutterings and a few grains of rice, a little betel, and huldī, and then fixes in the centre, in a small hole dug for the purpose, a branch of Semul (cotton tree) or more usually, a plant of Renda (the Castor) round which he ranges five cakes of chinna (4) This is called *Huli ka har* (or dunda dhurna,) and the spot "the Huli," and for the whole ensuing month nothing is thought of among the boys, but how to steal wood, grass, cakes of cow dung, &c to heap around it The Huli however is played languidly till the 8th Sudī of Phalgun, the Hul Ashtuk or Phāg, from which day till the full moon, business is dropped, and as at the Saturnalia, there is no betrothing, or marrying, no new work should be undertaken, debtors are not harassed, (5) schools are closed, &c But it is from the 11th, the Amardukī, that they begin the sports in earnest The boys have by this time grown more bold, and rove about in all directions to feed Huli Mata In the conduct of these foraging parties they sometimes, and ought always, to mimic the bustle and preparation of an alarmed camp, as enjoined in the Brimha Vaidertuk, "as if you were rushing to get your weapons," says another Purān (6) One makes off with a door, another runs away with a bed, and some old woman perhaps, who has gossipped too long at the well, finds on her return home, half her hut unthatched. To make the matter worse, nothing that has actually reached the Huli, can be taken back, though if the thieves have been disturbed at their work, and drop their prey, it is then redeemed by the owner Sometimes indeed a sulky person will insist on taking his property from the very pile, but the boys so torment him with abuse and railery, shouting in his ear the dreadful and infallible penalties of such sacrilege, the death of the first-born, &c, that shame, or fear, generally induces him to withdraw his claims, and to join, with as good a grace as he can, in the general grin

At last the longed-for night, the full of the moon, has arrived —For some days previous, the women have been busy making little cups of cow-dung, called bullas, in the centre of which a hole is bored, so that several may be strung together into a necklace. Each head of a family, bearing in his hand, (like some Greek suppliant with his ever-

4 The local name for cakes of cow-dung, more commonly called kunda, ussara, or gobur

5 In the day similarly kept sacred during the Jewish Huli, the Passover, money matters might be attended to,—a characteristic distinction.

6 From the clashing of the sticks together on this occasion, and the sound of kil kil made by it, some derive the name of Holica, others from Hodui to go, the d and l being changeable

green thallus) a plant of Castor, (6) to the top of which an ear (bali) of jao has been attached, and taking with him as many cow-dung necklaces (bulla ka mala) as there are males in his family, proceeds to the Huli, round which the old and young of the village have collected. The potail having arrived with some little state, and the noisy accompaniments of singing women, tom-toms, blowing of horns, &c., the poojari squats near the pile, his implements of worship, grain, cocoa-nuts, rachna, (mixed haldi and lime) before him, and the usual *pooja ritē peracta*; either he, or the head man of the village sets fire (7) to the Huli, upon which all the malas have been previously thrown, each householder however reserving one, which he takes home again (8) The moment the pile begins to blaze, they look anxiously to which quarter the flame is driven by the wind. The East is the fortunate point, the West and North are also good, but the South is the sign of blight and famine. Ills also follow, should there be no wind, so that the flame should rise up straight (9)

The Huli is next perambulated seven times (10) by the assembly, who

6 Most of these ancient rites, now diffused through foreign countries, have been so distorted and diverted from their original intent, by the adoption of new creeds and other causes, that the analogies can be sometimes but faintly traced. The practice here mentioned of bearing boughs, may have a like origin with the similar one of the ancient and modern Jews, at the feast of tabernacles, the suspending branches to their houses of the Chinese and Japanese, at the festival of the new year, and the like superstitious ornamenting of our churches at Christmas

7 Some think that the Huli should be fired by a light newly struck from a steel, or perhaps more correctly from two pieces of dry wood, the aram of antiquity, but this distinction is frequently neglected. In the Deccan the outcasts have a separate Huli, from which a lighted log is brought by force, to serve as a match for the grand pile. See for an interesting account of this, the *Soon paper*, *Bombay Transactions*, vol 3

8 This has probably some connexion with a superstition (not wholly unknown on other occasions in India) which was common to the Greeks and Romans, with whom it was usual to carry home part of an oblation for luck's sake (Potter, whom with Alexander ab Alexandro and Boulanger (*l'antiquité dévoilée par ses usages*), I have principally consulted for the parallel rites of ancient Europe.) The reserved mala is kept in the house during the year, and on the succeeding Huli is taken and burnt with the rest, and a fresh one laid by in its place

9 The Greeks derived omens in a similar manner from the direction of the flame of a sacrifice. See *Potter's Antiquities* I, p 371

10 Three times is the more correct number of perambulations according to the *Pudum Puran*, and is certainly that which has been, in all times and nations, most common, as in the "*Deasil*" still performed round Cairns on Sundays and holidays in our own country. It is also the number most usually adopted in India on this occasion, (*Bombay Transactions*, vol 3 *Pinkerton's Voyage and Travels*, III, p 602, 371 *Pliny* 28 2, *Potter* II p 253, &c.) but the use of the number seven seems to be quite as ancient. A cow was led seven times round the temples at the Egyptian festival commemo-

as they walk round, throw rice, &c. into the flame, and dip into it, so as to scorch the jao, (11) their castor plants, mutter prayers and vows, and offer up numuskar with joined hands This "Purduksheva" over, the bugulgir (or embrace) succeeds Friends embrace each other (12) as if they had long been separated, (13) many exchange their reserved malas or castor trees in token of regard, the chela touches his master's feet, the son those of his father, and the "labratum" on this occasion is not unfrequently extended by the young to any respected senior

The scene now becomes very lively Each kisan (cultivator) hastens to secure from the fire a half-burnt stake, which he sets up in the centre of his most productive field, where under the name of Huh ka Raja, it acts in a triple capacity, attracting good crops, averting evil eyes, and serving like its classical parallel, the "ruber hortorum custos," to frighten away birds (14) Parties may also be observed scampering away in every direction with lighted bullas snatched from the flames, to replace the culinary fire at home, which has been religiously extinguished, according to a superstition general all over India, and which many of the poorer Mussulmen have adopted (15) Great pains are taken in a few families to keep this fire alive during the year, its accidental extinction is regarded as the sure precursor of some great misfortune, and there seems to be, or rather to have been, (for the custom

rating the search for Osiris, and the Jews still seven times circle their altar at the feast of tabernacles Boulanger and many others, devote whole pages to the mystic No 7—See Moore's Pantheon, 300 Burder on Exodus xx, 10, &c &c

11 The ear of barley is taken home and carefully preserved, being considered of much efficacy in the cure of various diseases The castor plant they throw away

12 This custom has probably lasted longer, and been more generally diffused, than any other of these ancient rites Marco Polo mentions it as a principal ceremony of the white feast of the Tartars In Persia, at the Nou Roz, there is no end of kissing, and our own new year's compliments will not be forgotten

13 This custom is in some sort repeated at the Dewali, and Beeja Dushi The ingenious theorist Boulanger would have been glad to seize on it in support of his favourite arguments—See Ant dev, 1, 233

14 See Tod's Rajasthan, 2, 662

15 In the north of England a remnant of the Yule clog is put by to light the next Christmas fire with, and the place where it is kept is considered safe from demons In some places the new year's gift which the king sends to his vassals is fire, which being brought, all the old fire is put out, and this new fire all the neighbouring people are obliged to fetch every one for himself, upon pain of incurring the guilt and punishment of high treason—(Montaigne's Essay on Customs and Laws) At the Chinese festival of the new year, every one carries a lighted candle or two to the temple These superstitions relating to fire are very ancient, and date doubtless from those times when religious rites, as inculcated in the Vedas, consisted chiefly of Homas

is nearly exploded) an objection on the part of either borrower or lender, to its being removed from a neighbour's hearth. In travelling among the Bheels of Bagur, we met with some tribes among whom the prejudice on this point was very remarkable (16)

These more solemn ceremonies ended, riot is let loose; now (17) commences the "kubeer," the abuse, the foul language, which all join in without a feeling of shame or of anger (18). The children are not the least active in this war of words, and at the pitch of their voices is a "Galian gate hai ke sunnesi husi ati hai" (19), being incited to it by their elders, as it is believed they will thus lose all fear of bhoots, and jins (20). Many of the more respectable people return about this time to their homes to be present at the interesting ceremony of burning the family Huli. The middle of the room having been carefully swept, and smoothed with cow dung, the *pater familias* describes with "chundun" a figure of a square, ornamenting the edges and centre with some pattern, as of a lotus leaf, and in the centre of the interior lotus, raises a small heap of dry sticks, bullas, &c, then taking a roll of thread in his hand, and measuring every one present in succession, he cuts off for each individual, tall or short, a portion of the thread, equivalent to his height, and lays the pieces one after the other on the little gur ka Huli, he does not forget also to cut off a thread for himself, and making a guess at the height of any absent relation or intimate friends. This thread may be considered in the light of a scape goat, for as it disappears in the flame, all the griefs, sickness, and ill luck (if not the sins) of the persons included in the rite, are supposed to be dissipated, and burnt with it. (21). The ceremonies just before celebrated

16 The fires which ought not to be allowed to go out, (see Ward's Hindus) and which in former times were as carefully watched as was ever the undying flame of Jew, Sabian, or Vestal, are now hardly to be found but in the families of Agnihotra Brahmuns, to which class however the custom is by no means confined exclusively, as might be suspected from Ward's note, the practice, apparently from the difficulty and inconvenience of its observance, has fallen into general disuse. See A R 260

17 Or ought to commence, but in reality the licence of the tongue begins at least a week before the burning

18 Any fool, says the Brimha Vaiverta, who does not do so, goes to hell for as long as the sun and moon reign

19 The quaint expression of a little Cassi manual of the yearly festivals, some parts of it have been copied into the "Hindu selections"

20 In England fires are in some places lighted on Christmas eve, to drive away evil spirits

21 A zealous analogist would suggest some resemblance between this rite, and the worship during the Compitalia of the Lares, to whom it was at that time customary to offer small images of wool, one for every member of a family. (Pompeius Festus ad verba Lania et Pila)

at the public Huli, are here also repeated in miniature, the offerings, the lighting of the pile, the seven parikramas, the bugulgir, in which last, those have the opportunity of joining in homage, whom sickness or accident may have confined to the house. After this every one having made a *tetuch of rockna* on his forehead, the party retires, rejoining the general assembly, and the women taking its place repeat nearly the same ceremonies, and amuse themselves with throwing abeer, (red powder) laughing, chattering, and singing till morning. The rabble in the interim have remained at the public Huli enjoying the fun of flinging about abeer, squirting water or oil, whose smell is not pleasant, (22) bandying gali, (or abuse) "dancing, and singing like devils incarnate," and shouting out *φαλλικὰ-ἄσματα*. After about two hours spent in this manner, the whole body sets out on a tour through the village, drums beating, women screeching, and every one trying to make as much noise as possible, at length, about the eve of dawn, they halt at the potail's house, and from thence gradually disperse to their respective homes. On the first of Cheyt (known from the flinging about, and marking with ashes) by the names of Duraheti (23) or Bhusm Bundum (Sanset Rujotsa,) every one shaking off the fatigues of the night, rises after a few hours sleep, eager to commence the sports of the day. This chiefly consists in flinging dust, and squirting water, coloured with saffron or some such stuff, at each other, and is first played among themselves by the members of each family. The women take a part in the fun, a man for instance runs up to his Bhajai (elder brother's wife) having his palms smeared with wet abeer, and pretending to make a salam, rubs it over her face. The lady takes the joke in good part, requests to "soorma" his eyes on this happy morning, and covers his whole face with a kajul (lamp black), or perhaps runs off with a part of his dress, which he only gets back by making her a present. Such jokes having lasted a certain time, the men hasten to the potail's chabutra, (terrace) the rendezvous of the village, and where similar sports are being acted, but with more noise and licence. The women of the family from above shower down dust and water on the crowd below, who return the compliment by volleys of indecent gali-gali, which is heard without a blush at this season alone, and does not excite the slightest sentiment of anger (24) Universal good humour

22 Hamilton's Travels in India. Among the Birmans the throwing of water is the principal amusement

23 The Duraheti is sometimes put off to the 3d or even the 5th

24 No respectable woman during the Huli will leave her house, except in case of actual necessity, as every body she meets will insult her, but in the midst of this ap-

indeed prevails, and the zemindar frequently seizes, with success, this favorable opportunity of bringing parties together, whom some trifling quarrel may have estranged. "Let all ill blood," he will say, "be considered as burnt with last night's Huli, &c &c." But all are getting impatient for a change of fun. The potail therefore rises, and with the village rabble at his heels proceeds to the extinguished Huli, with the ashes of which every one makes a tiluk, using a particular muntra (holy formula) on the occasion, and snatching them up by handfuls, throws showers over his own or his neighbour's head, then with much noise, and indecent mirth, they march in procession about the village by a fixed route, from which year after year they never deviate (25), stopping before certain houses, as that of the Chumar, Aheer, &c who claim the distinction as their privilege. Here they raise frantic shouts, bawl out obscene verses, and abuse the inmates in the coarsest language, presently out rushes a woman, and begins belabouring them with a stick, returning the abuse with interest, snatching then some person's cloth, she pulls it off, and the sufferer must pay a small fine of ghee, sweetmeats, &c before he can get back his garment, or the woman will seize hold of some individual, generally a poor relation of the potail, or the village butt, and dragging him into the house, dress him up in women's clothes, and set him before a chuki (hand-mill) to grind grain. Of course, as before, he only gets liberated by purchase. The fines are the perquisite of the house owners, which explains why the visit was desired by them.

The excesses committed during this procession are scarcely credible, extravagance seems to be considered a religious duty. Not content with throwing about dust by handfuls, they fill small baskets with it, which they empty on the heads of all round them. All distinctions of rank are levelled, any chance passenger, "be he hakim, old man, or raja" is obliged to bow to the law of the Huli, they must bear with a good grace all the vulgar gali, must submit to the clouds of dust and ashes, to having dirty water, and "gingerly oil" (as Hamilton calls it) squirted in his face, and to be well pummelled with patlis (little bags full of water ingeniously made on the spot, in a cor-

parently unbridled licence, certain rules of propriety are religiously observed, processions of females, for instance, would not be interfered with. This conventional decorum is perhaps less strictly attended to here.

25 To do so in the slightest degree, even by turning down a different lane, would, it is supposed, entail some misfortune on the community, as was threatened to the deserters of the *ἱερὰ ὄδος* of Eleusis.

ner of the dhotis), fortunate if he has fallen into a comparatively quiet set, and escapes a pelting with mud, shoes, filth, or stones. Already much excited, and imitating drunkenness, *ebrioli*, if not already drunk with opium, bang, and other such intoxicating (drugs, without which indeed they could hardly support the fatigue of such violent and prolonged sport) the mob with this rude play, and its concomitants shouting, singing, and Bacchanalian dancing, has soon worked itself into a sort of frenzy. they dress themselves up so as to look like bears &c or as the Brimha Vaiverta instructs, "make a swan or a monkey with cotton" The most absurd antics are played you may see two individuals abusing each other in the grossest language, immediately afterwards joining in unmeaning and immoderate laughter, "Ex turpissima lite in risum diffusi" Near them perhaps, and with equal reason, stands a man sobbing bitterly as if some misfortune had happened to him (26); others "delighting in nastiness and holy obscenity," clothe themselves in outrageous fashions, (or like the *ἰθὺφαλλοι* at the Dionysia, in women's dresses) and strive to outdo each other in their indelicate and ridiculous postures, nor will they feel shame in thus acting, though their "mothers or sisters or brother's wife are looking on" (27) All classes seem to lose their senses, an individual on all other occasions quiet and decent in his behaviour—some bunian for instance, well off in the world—will forget, for the time, all sense of decency, and think it no degradation to expose himself for the sport of an insane rabble. He seems to be the prototype of the "*Rex-stultorum*," round his neck will be hung a disgusting chaplet of old shoes, live frogs, and bones, a broken dust basket, supported over his head on a bamboo, represents a regal chatta, worn-out brooms, supply the place of chowrees, and his face having been blackened, he is mounted on a sorry donkey, (28) and paraded in mimic state through the streets, his drunken attendants hooting, shouting, calling him all the fine names they can

26 This, which might seem to be connected with those demonstrations of grief which some believe to have pervaded all, and particularly this, the apparently most joyous of the festivals of antiquity, is generally acted as if real, can be nothing more than the maudlin of drunkenness, as the exuberance of a forced and unnatural gaiety, a mere variety of extravagance (major dementia)

27 The last sentence, and much of the succeeding description [of the truth of which I have taken pains to be assured] are copied from a little Jain treatise against these practices, called the "*Mithy at Kund*," which we might translate, the "*Bank of Fallacies*"

28 Putting on an asses' mask, and mounted on an ass

think of, and reeling and tumbling around him like the chorus of Silenus (29)

These sports are all over by about midday, people now bathe, change their clothes, and become rational again, and returning to their homes, refresh themselves with the best dinner their means can supply (30) In the afternoon complimentary visits are paid The zemindar attended by his ryuts, calls on his relations, presents are interchanged, and every one is clothed in his best clothes and smiles Our own new year's customs are in fact rehearsed even to the Christmas-box, certain of the village tradesmen, such as the jumooli (washerman) the bhooli kahar (or water carrier of the better classes) the guides, &c call at the houses of their employers, to remind them of the time-sanctioned present, which is in many cases their only pay—some of them displaying the instruments of their craft. The barber, for example, thrusts his mirror into every face which he shaves, and his similarly armed wife making the tour of the zenanas, will not fail, if she have any wit, to flatter the ladies into a generous humour, and to gain a pretty penny by showing them what they love the most. The bari (leaf-plate maker) makes up showy plates of painted tamarind leaves, which he distributes around, and few come without some trifle as an offering At night the Phul dool (31) attracts a crowd of worshippers, all taking care to propitiate Bhugwna, by laying on his tukht, (throne) some offering proportioned to their circumstances, but where there is a Ramdwara, the superior splendour of the Ramsanehi (32) floralia, draws away a large proportion of the spectators from the worship at the temple

29 The many parallels to this curious scene will suggest themselves to every antiquary. The ass which bore the feeble old man in the parody of Pegasus and Bellerophon (Apuleius) The procession, smutted faces, women's dresses, and "imitation of the braying of asses of the festival of fools (Strutt) The king of the feast of the Persians, whom they used afterwards to put to death The Abbott of Misrule, described by Walter Scott in the Abbott, not to speak of the more generally known rites of Greece and Rome

30 On this day, says the Brimha Vaiverta, "wear garlands, eat pán, and wear good clothes, and mix with women, whoever has not remained with women, is nothing worth Play with widows and dancing girls, and gain beatitude, certain wealth, and a sor, and if you are lame you will get cured"

31 The celebration of this Pooja is very irregular here it generally varies from the 1st to the 5th of Cheyt budi At Bindrabun it is put off till the 11th At Juggernath (according to the Mahatma of that place) it lasts from the 8th Suvi of Phalgun to the 1st Cheyt

32 The larger proportion, (the demi-philosophers of the soi-disant Deists,) can hardly bring itself entirely to spiritualize the symbolic Ram It seems to yearn for the flesh pots, and hugs its *one* festival with an affection scarcely orthodox With many



The customs above described as practised on this day, may be considered (independently of trifling local differences) as common both here and in Upper India, but there are others peculiar I believe to this part of the country or Rajpootana, which must not be omitted, one of them is very pleasing Visits are paid by the head of the village "with his tail on," to any house in which there may be mourning, the owner of it if a man, comes out, and being reminded that all sorrow should be extinguished with the Huli, some of its ashes are sprinkled over his head, processions of women pay similar visits of condolence to females in distress

But the favourite sport of the day is in the afternoon In most of the market villages may be observed erected two poles, about fourteen feet high, with small sticks stuck into them to be used as steps to mount by, these being painted red and repaired for the occasion, a great crowd collects around them, where some bhl or bulai (village guide) having a hook let into the flesh of his back, is swung round as at the Siva Sanyasas in Bengal, but here more considerate and humane than in Bengal, they place a charpae under the turning cross pole, which receives the sufferer, and prevents a dangerous fall, in case of the flesh giving away.

At the foot of the poles they place any old image, generally some fragment of sculpture from a ruined temple, which is called for the day Megh Nath, and it is in his name that this cruel Parikrama\* (for Parikrama it is considered) is undertaken, sometimes in performance of a vow, or to get cured of a disease, or even for the petty subscription which is raised for the victims from the spectators. The deity worshipped is said to be Bhairava, but I do not remember why on this particular day he should be called by the name of the cloud lord, the son of Ráwun In the Deccan they seem to have wrestling, &c. as a substitute for this, and the place where the wrestlers assemble is dedicated to Vetā, the prince of the devils Between the poles a chool (pit) is some-

Ramsane is indeed the Phul dool, and like Mrs Wilson's dinner, serves as business for the whole year, six months being occupied in talking of the past, and the other six in preparations for the coming festival Its celebration on this particular day, and the general belief to be found in many books (see the Hindu selections,) that Ram instituted the Huli, induced me to tax the Baba-gee of a Ramdwara at Indore, with observing that superstition, which he indignantly denied, he gave me however a short but suspiciously sect-spirited history of that festival, which will be mentioned in its place

\* NOTE — A *Parikrama* is the act of going in a circle round any object It is an act of adoration, performed in various ways, and varying with the Deity who for the time is adored

times dug and filled with hot ashes, across which women run, generally those who have vowed to do so, should they be blessed with a son, in which case they cross it with the "child of the vow" (33) at the breast—but the distance is such a mere step, that they as rarely get scorched (34) as did the priestesses of Diana during the similar ceremony. Though if Sonnerat is to be believed, which he is not (35), it is not in every part of India so easy an ordeal.

There is a peculiarity in the Duraheti here, that it is not as in most places restricted to the 1st of the month, but continues during several days, many classes having a sort of exclusive Duraheti, when they only play with their own kith and kin, but I must confess I have been able to get very little information on this point, nor could, or would, any one explain the rules by which these associations are regulated. In some castes, the licence on these occasions is frightful. Men, I have been credibly informed, unsatisfied with common filth, smear themselves over with ordure, fling it at each other, and remain covered with it for days, during which time they do not enter their houses, and their bread is cooked, and flung out to them by the females (36). But such horrors, and all the more outrageous extravagancies, are confined to the lowest classes and to towns, the village amusements being generally of a more simple and pleasing character. On the second day of the month, Juma-ditya or Jumgut, the brahmun worships his shastrus, the koith, his pen and ink, the banker his books, and the mass some Devi or other, at about 12 a grand assembly (Jumgut) takes place at any principal house in the district, invitations being sent to all the neighbourhood where nautches, masks, &c amuse the folks till night. Here should end the festival, but where the district is rich and populous, the zemindars of different villages have their separate Jumguts on different days, these rarely extend beyond the 5th, the term observed by respectable people, and in the Deccan, and called Rung Punchmi, but some of the lower classes continue the sports for a few days more, and in this part of the country, they are not concluded till the 13th, and by

33 See Calmet's Dictionary

34 Boyle, art Comane

35 It is Sonnerat, I believe, of whom the following story is told. A friend of his who had been in India congratulated him on the success of his book, but said he, I never saw the fine things you speak of. My good fellow, replied Sonnerat, I did not write for such as you, but for those who have not been in India.

36 On such points as these it has of course been necessary to trust to native information, but great pains have been taken to establish accuracy by comparing different accounts.

some of the Mahrattas even till their new year's day, Ghori Prewar, a day the tribe keep with a spirit quite unknown to their brethren of the Ganges.

It is I believe on the Jumgut, that in some parts of Malwa the women collect round the burnt Huli, the charred wood of which they pound into ashes, taking some home to be used as medicine. A singular ceremony next takes place, it has from ancient times been considered in the East, and especially in India, an act of the highest indelicacy for a man to utter his wife's name, or a woman that of her husband's; (see Ward's *Hindus* i, 199, ii, 529) on this occasion however the women alternately ask each other, What is your husband's name? The reply to which is given in a whisper. This mystery is practised in most places at other times, as during the festival of Gangore, of which Tod has given a slight sketch, but which as exactly resembling the rites of the Bona Dea, deserves a more particular description. In the Deccan at the Nāg Punchmi, the women ask each other their husband's names, and the answer is given in rhyme *Bombay Trans* iii, 217

Many other are the curious and interesting superstitions which might be elicited, by observing the customs of these rude tribes, who have preserved many ancient usages, elsewhere abolished. Some of my notes have been mislaid, but among my memoranda of superstitions to be inquired into, I remark one regarding a Mahratta custom of wearing a seal on the right breast during the Huli, of the nature and meaning of which story I am perfectly ignorant. Of the different amusements of this season, a favourite one is the making of April fools, the similarity of which custom to our own has already been pointed out in the *Asiatic Researches*, and in Mrs Grahame's letters.

As an example of the tricks, I select two which have classical parallels. Imitation sweetmeats made of coloured mud or chalk are sent about with due ceremony, as presents "Vidi" (says Eacolpius in the supper of Trimalchio) "Romæ Saturnalibus ejusmodi (de luto) cænarum imagines fieri." The other example will be more commonly recognised, as it is exactly what Horace (epist 1 16) adverts to. A rupee is made fast to a chabutra by alum or some such stuff, and the different gestures of the person taken in by it, joy and eagerness at the discovery, puzzled looks at being unable to pick it up "in trivius fixum cum te dimittis ob assem," and disappointment and rage at detecting the trick, prove a fertile source of laughter to the concealed wits. Persius also alludes to the same deception, (Sat 5) "Inque luto fixum possis transcendere

nummum?" Another common joke is less excusable, a party of seemingly grave persons are seated at a shop, a traveller passes "Where are you going to?" "Such a village" "Oh then just carry this pot of ghee for us to the potail, and here is an anna for you" The vessel is accordingly lifted on the head of the unsuspecting stranger, but before he has gone many steps, some one gives it a blow with a stick, and the unhappy porter is drenched with mud and filth But the old fashioned pleasantry of flinging about missiles, may be considered the pet frolic of the Huli To such an extent is this practice carried in some places, as about Muttra for instance, that the roads are nearly closed, and travellers do not attempt to continue their journey, as they would have to encounter a storm of brick-bats, wood, mud, and shoes, if not of disgusting filth, at every village through which they passed At Cawnpore the pelting of shoes was, a few years ago, so great a nuisance, that it was a work of danger to walk through the town, and even now, from the same cause, respectable quiet persons dare not venture into the bazars during the three great days of the Huli For weeks before, every sort of missile is heaped up in the shops on either side of the way, and the favourite weapons, cast-off shoes, fetch a fair price The opposite houses, fight pitched battles with these primitive arms, and as may well be conceived, any hapless traveller, (37) who shall unconsciously pass that way, thus planted between two fires, is fortunate to escape with only a few bruises, for in some towns, even stones are flung, and serious accidents not unfrequently happen

It cannot be expected that such rude play should always be taken in good part, and in fact, though the chief people by judiciously endeavouring to turn all complaints into ridicule, prevent much of the mischief, quarrels are very common, and swords and blood are not unfrequently drawn I had several accounts of the Huli drawn up for me by people of different ranks and castes, and a sentence in one of them very strikingly exhibits the danger of these sports "When we return home to sleep we bless Bhugwan that we have gone through the day without being engaged in a dispute" The Italians are well aware of the danger of their more civilized mirth, and lesser licence, and (according to Williams's Italy) swords are forbidden to be worn during the carnival

The common rendezvous of the principals in such mischief is in the

37 Strangers are the principal sufferers, for of course there is a convenient understanding between those who are engaged in the current and necessary business of the day, sellers and buyers of food, &c

middle of the bazar, where may be seen stretched out in the road, a preposterous and indecent figure of a man, made of a few sticks and old rags. This Indian Priapus, much the same probably, as the "horrors" which Asa set up in the grove (2 Chron xv 16,) is here called Nathoo Ram, and is equally common in Rajasthan (Tod) and in the Deccan, (Bombay Trans vol 1 240) Nathoo Ram we were told was a bunian, a notorious gallant, whom a Rajpoot finding too intimate with his wife, killed during the Huli. This figure forming the standing joke of the season, food is daily presented to it with ludicrous gravity, it is plentifully smeared with abeer, and all sorts of absurd antics are played around it, nor can any one pass the spot where it lies without a volley of jokes being discharged at him, unless he has the tact to avert the storm, by paying his devotions with jest and ribaldry, to this exact representative of the Syrian *neuro-spasta*.

Numerous games are also played during the Huli of a more quiet character, which vary of course in every country. The most common one is well known. men range themselves in two circles facing different ways, each person, armed with a stick, goes dancing round, to the tune generally of a fife, and strikes the stick of every one who comes opposite to him. This is the characteristic dance of the Hindus in Afghanistan, and more particularly in Seestan.

A second one, common here, particularly among the Aheers, is as follows —

The men assemble in one line, the women in another, all armed with sticks, which the former use only as shields. The boys look on, for these games are played chiefly by grown up people, "senes his pueros," a battle is mimicked. The women raising a sort of Poan, strike their sticks against those of their shouting adversaries, who allow themselves to be slowly driven back, when breathless, a few minutes truce is allowed, till some one calls out, the "succours are at hand, the suwars have arrived," and the like, and they again set to. The spectators reward the actors with a trifle.

In the evenings the simple rustics enjoy, with undisguised delight, mimes and farces of the rudest description, and which to a townsman would appear insufferably dull and disgusting, for the more amusing plays of the Mahrattas, of which Malcolm and Grant Duff make mention, are rarely acted. Of course the quality, and longer or shorter continuance, of the nautches depend on the means and will of the givers, but many of the richer zemindars commence them from the 11th of Poos Seedi, and keep them up to the 5th of Cheyt. According to the

Pudum Puran, they should continue till the end of spring, till the sun enters —————

On the 13th, the last day of the Malwa Huli, a game is played which has some resemblance to our village greased pole. A pole is erected, of such a height that a man by standing on another's shoulders, can reach the top of it. The women all assemble near him, each armed with a castor plant, a fowl, a piece of cloth, or some such trifle is placed on the top, and is the perquisite of whoever can take it off, assisted only by one other person. The women strike the candidates as hard as they can with the plant rods, hooting and shouting all the time, and frequently contrive to drive them off, so that the contest is productive of much amusement. The women on this occasion claim the privilege of stopping every passer by, and making him pay toll, a custom which will remind the reader of Strutt, of the rope laid across the roads at this season by the ladies of Hackelay, and of "Binding Tuesday", in our own country. In Booneer of Afghanistan at harvest time the Eusofzy women have a somewhat similar privilege, every one they meet they compel to dance, or to pay them a fine.

It was my intention to have concluded this sketch with select specimens of the songs sung during the festival, and with extracts from the Sanscrit books which speak of the Huli. This plan I must of necessity in part abandon, being far removed from Hindu books and Pundits. Some of the more common songs may be seen in the "Hindu selections." Many of the purans, and other sacred books of the Hindus and Jains, make some mention of the Huli, of these we may instance the Pudum Puran, the Kulpa Drooma of Jey Sing, 4th Kund, the 3d Kund of the Scauha Puran, the Mithy-at Kund, and the Brimha Vaivert.

To give some idea of the nature of the fables to be met with in these authorities, a sketch is given of the story of the Huli as told in the last named book, which however it must be remembered was written only some four centuries ago. I know of no very ancient Hindu authority on the subject. As the Brimha Vaiverta is devoted to Pracrit worship, much indelicacy might have been expected, but the gross indecency of its account of the Huli makes it impossible to render it at all literal in English.

In the Sutyā Yug, Mahadeo caused the production of a female demon called Holica, whose violent conduct was highly offensive and terrifying to the gods, two of whom, Brimha and Indra, she caught and kept prisoners, wandering about with them, delighted at the fear of the gods. They addressed supplications to her calling her by

twenty-four names, Trigita, Tamuse, Dhumra, Dwanchi, Dhoonda, Holica, &c , appeased and pleased with these names, she laughs with a loud voice, bids them dismiss their fear, and promises that the evils for one year are remitted, if on the day on which she was made so happy, they will rejoice, clap hands, steal wood as if for war, spill and steal all people's milk, &c According to the Pudum Puran, a Rukshisi named Dhoonda, obtained by worship to Sheo an exemption from all evil, except such as could be inflicted on her by innocents (38), from which time she began to persecute all children, and can only be propitiated by the ceremonies as above ——— The Mithy-at-Kund, a Jain authority, states the origin of the Huli as follows—A Sahukar's daughter, fond of gallantry, was in the habit of meeting her lover in the disguise of a slave girl, fearing however that the girl from whom she borrowed the clothes would betray her, she contrived to lock her up in a room where wood was kept, and there miserably burnt her to death The spirit of the slave girl became a Bintruts Deota, or Bhootni, &c &c &c Such are the *aniha*, to be found in Hindu books, respecting the origin of the Huli, and they are all different We will conclude with one more account of it, the quaint description of Hamilton “ Wooli (says he) was a knight errant in times of yore, and a fierce fellow in a war with some giants who infested Sindy, and carried away naughty girls and boys, and made butcher's meat of them ' ” It would have been easy by quotations and analogies from classical authors much to have extended these remarks, but I fear you will think them already too much extended, the subject however treated of, though apparently puerile, is curious and not uninteresting, and as Malcolm remarks, “ we may expect to throw light on the ancient history of India from minute inquiries into the origin of the usages and superstitions of the lowest classes of the population ”

In a future letter some account will be given of the inscription of Chandragupta, and the other inscriptions of the facsimiles of which you have acknowledged the receipt (39 )

KHAN ALI

38 The Sanscrit उन्मत्तेभ्यः शिष्येभ्यः has the same double meaning of “ silly ” and “ without sin ” as has the word innocent in English

39 For the many errors of this imperfect and unfinished paper, the circumstances under which it is drawn up must plead an apology

*Wool and Woollen Manufactures of Khorassan* By Capt HUTTON,  
37th Regiment, N I

GOAT'S WOOL, OR DOWN

The goats of the hilly tracts of Khorassan yield, like those of Cashmere and Thibet, a fine and remarkably soft down, growing at the roots of the outer or true hair

The colour of this wool is generally of a shade of brown more or less intense, and the outer or hairy coating of the animal is long, and usually jet black The *white down*, is scarce

These goats are rather short legged, very shaggy, and very generally horned, they are rather small, and very graceful looking animals

The best are said to be among the Hazarree and Tymunnee tribes

These goats produce two fleeces during the year, the first during winter, which is gathered in spring, and the latter during summer, which is gathered in autumn The latter is said to be in most esteem, and the finest The reason given is, that in winter the severity of the season checks the natural exudations from the pores of the skin, and keeps it dry, and that consequently the hair receives less nourishment than in summer, and is therefore coarser and less soft

The heat of the summer months, on the other hand, causing a plentiful discharge of moisture from the pores of the body, furnishes abundant nourishment to the roots of the hair, which becomes in consequence, soft and silky

The winter fleece is therefore sheared off with the hair, and after undergoing a partial cleansing from hair and animal matter is made into "*Koork-i-Puttoo*," which comes chiefly from Beerjund, in Persia

The long hair after separation from the wool is made into grain-bags, tents, and ropes

The autumn fleece is only taken from dead animals. The goat is killed for butcher's meat, and the skin well rubbed over with a solution of lime and potash, and left thus for two or three days, until incipient decay has taken place in the skin, and the hair is easily pulled out, leaving the under wool, or down, free, which is then also taken off separately

This method appears in all respects to be the same as that practised in Koordistan, as related by Captain Conolly, but the lime with which the skin is rubbed over does not here injure the wool It is first pulled out of its natural masses by the hand, and afterwards farther sepa-



rated and cleaned in the same manner as cotton, and then spun into threads

The autumn wool is gathered from the skins of animals which have been slaughtered for food, and it is dearer than the winter fleece, on account of its superior fineness

In Captain Conolly's Book of Samples, I observed a dark brown wool, labelled, "*Thibetan Shawl Wool*" I may mention, that during a trip through some of the Tartar districts of the Himalah, where the Shawl Goats abound, I scarcely remember to have seen one dark coloured animal, the prevailing colour being white, with sometimes black ears and head, the wool, or 'Pushm,' as it is there called, being consequently quite white also The wool in Captain Conolly's book appeared to me to be the same as that of Khorassan I mention this, in case he should have sent you specimens

No 1 Is a sample of the wool of the prevailing colour, and procured from black goats at Candahar, it is the winter growth

No 2 Is another shade Both are characteristic

No 3 Is a woollen cloth manufactured at Beerjund, in Persia, from the winter fleece, and is interspersed with the hairs, which are only, as above mentioned, partially separated from the wool after shearing

This sample is called "*Barak-Koork-i*," it is made in pieces of from 9 to 12 inches broad, by 8 to 12 yards long, at from 4 to 10 Company's rupees per piece

No 4 Is another sample of a similar, though lighter coloured cloth, from the same place, and of the same kind of wool

The price in Beerjund is 5 rupees per piece of 7 yards, which as the yard there is 42 inches, and the rupee equal only to 8 annas, makes its price in Company's rupees to be 2-8 per 8 yards and 6 inches The rupee in use at Beerjund is "*Adam-Khan-i*"

In Candahar the same quantity sold for 8 rupees, each equal to 12 annas, so that the cost from Beerjund was increased  $3\frac{1}{2}$  Company's rupees This was owing to the endless duties levied on the road, and Kohundil Khan\* exacted a farther tax of  $\frac{1}{40}$  on its arrival

This cloth is also exported to Cabul, Scindh, Shikarpore, and other places At present the greatest quantity goes to Tehran, and in Candahar and other Afghan towns the demand is far greater than the supply

\* NOTE —One of the three brothers of Dost Mahummud Khan who held Candahar after the revolution as a separate government The taxes on trade and manufactures levied by these chiefs were most oppressive

No 5 Is a finer kind, made of lighter coloured wool The sizes the same

No 6 Is called "*Puttoo Koork-i*," it is from Herat, Beerjund, and Seistan The best however is produced in Cabul The foreign duty on this is  $\frac{1}{40}$ \* but in Kohundil Khan's time it amounted to  $\frac{1}{7}$  besides the various taxes on the road It is in most demand among Hindoos It is washed after being woven, to *swell* the threads and give it a thick and soft feel

The size is 4 to 5 yards long, by  $\frac{1}{2}$  to  $\frac{3}{4}$  yard wide, at 12 Co's Rupees per piece

No 7 This is the commonest colour, and the wool abundant It is made at Candahar, Cabul, and Herat It is also called "*Puttoo Koork-i*," each puttoo is made of two pieces, stitched longitudinally together, of the following sizes—

Largest size, 3 ft  $10\frac{1}{2}$  ins wide, by 4 yds 2 ft  $6\frac{1}{2}$  in long

Smallest size, 3 ft 10 ins wide, by 4 yds 2 ft long

A puttoo consequently, of the largest size, is 2 yards 1 foot  $9\frac{1}{4}$  inches wide, by 4 yards 2 feet  $6\frac{1}{2}$  ins long

One of the second size, is 2 yards 1 foot 8 inches wide, by 4 yards 2 feet in length

These are the outside sizes

The price of the first size was formerly  $13\frac{1}{2}$  Co's Rupees, or 18 Candaharees, now it sells for 24 Candaharees

The price of the second size was formerly 12 Candaharees, but is now up to 14 to 17 Candaharee rupees †

No 8 "*Puttoo Koork-i*" This wool is scarce, and is collected from all districts, Cabul, Herat, Beerjund, &c There is difficulty in procuring it, as the goats are usually dark coloured The cloth manufactured in Cabul is reckoned the best, and that from Herat the worst The cloth made at Candahar, during the sway of the Sirdars (of which the accompanying No 8 is a specimen) sold at 10 Candahar rupees per puttoo, or shawl of 2 yards 2 feet 9 inches wide, by 4 yards 2 feet  $5\frac{1}{2}$  inches in length

All puttoos vary from  $\frac{1}{2}$  to  $\frac{3}{4}$  yard wide by 4 to 10 yards long No 8 is an article of export to Scindh and Khilat

\* N B —The duties now levied on all merchandise are thus —Foreign  $\frac{1}{40}$ , Home made  $\frac{1}{100}$ , transit duty in or out, on all goods Home or Foreign  $\frac{1}{300}$

† N B Candahar rupee, or 12 annas, Company's

Few pieces are made, however, on account of the scarcity of white wool, and also because from its soon showing the dirt, the demand was very limited. It was chiefly taken by Hindoos.

No 9 Is from Herat and the Herat Hazarrees, it is made in pieces of  $\frac{1}{2}$  yard wide by 7 to 9 yards long, varying in price from 10 to 100 rupees according to its thickness, the thicker it is, the dearer.

It is not exported for trade, but travellers who can afford it, purchase pieces at the places where it is manufactured.

No 10 "*Nummud-Koor-k-i*" This is a felt, and is made at Candahar and among the Tymunnees, it is made to order of all sizes, and sells at 4 rupees for one yard square.

Felts are made in a very simple manner. a mat of rushes is laid open on the ground, and the wool spread over it, the mat is then tightly folded up, and well rolled backwards and forwards, by men pressing heavily upon it, by which means the wool becomes so completely matted, that it is almost impossible to unravel it again.

This kind of Nummud is used as an article of dress, but those which are used as rugs are made from the sheep's wool, and are much coarser and thicker.

No 11 "*Puttoo Koor-k-i*" This comes from Bokhara, and is made in pieces of about 10 to 12 yards long and 16 to 17 inches wide. In the Sirdars' time it sold from 12 to 15 Candahar rupees (12 annas) per piece, according to its fineness, at present the price is from 14 to 16 Company's rupees.

No 12 Is a sample of wool taken from a cross between the tame and wild goat of Khorassan. Of the latter a drawing and description will be forwarded hereafter. This is sent merely as a curiosity.

No 13 Is a sample of thread spun by the reel, or hand-wheel. There are finer than these.

No 14 Is thread spun by the hand.

N B —The Tymunnee woollen fabrics are,

- 1 "*Barak Shotur-i*," made of young dromedary wool
  - 11 "*Barak Barai*," made of goat's wool
  - 111 "*Barak Barai*," made of lamb's wool
  - 1v Tents, grain bags, ropes, and nummuds, of goat's hair and sheep's wool
-

## SHEEP'S WOOL — CANDAHAR

There are two varieties of sheep in this part of Khorassan, both possessing the broad fat tail. Of these the Tymunnee breed is the finest, and the tail often so uncommonly cumbersome as to impede the animal's movements, in such cases a small cart or support on wheels is placed beneath it, so as to relieve the sheep from the weight, and enable it to walk about. An amusing anecdote, serving to show the ignorant credulity of the people, is told of the method sometimes adopted for increasing the size of these tails. Fresh cold water is poured over the tail every morning, and when thoroughly drenched, it is well patted and rubbed all over by the hand.

The reason given for this treatment is, "*that the water softens the skin, and renders it, as it were, malleable, and consequently the patting and rubbing stretches it, so as to give room for the tail to grow*"!!

The people inhabiting the hill districts, where the pasture is generally better than that of the plains, possess large flocks, and derive their chief support from the sale of wool, woollen stuffs, croot (or dried curds) and ghee.

These sheep, like the goats already mentioned, yield two fleeces during the year—the winter and summer growth. That of the winter is said to be the worst, on account of the dirt and smoke which it collects while the sheep are folded, which is in woollen tents. It is, however, the longest, and is made into carpets, grain-bags, and other coarse articles. That of autumn is finer, and made into cloaks (*kosahs*) and nummuds.

The wool is not exported, but is manufactured in the districts where it is produced.

In the shearing time the sheep are well washed, and when dried by the sun, are clipped with large shears. The wool undergoes no farther cleaning. The woollens manufactured at Candahar from sheep's wool are made of the fleece, which is procured from the skins of slaughtered animals. If the skins possess merely the short wool, which is the remains of the spring fleece, they are sold by the butchers to the "*posteen*"\* makers at from one to two annas each, but if the animal is slaughtered in autumn, and possesses the summer fleece, the wool is taken off, and brings two to four annas, while the skin is sold separately to the tanners.

\* NOTE — A sort of winter garment of sheep skin with the wool on, universally worn in cold weather.

No 1 Is a sample of wool of the winter growth from a Candahar Ram The quantity yielded was rather better than  $3\frac{1}{4}$  lbs English This is reckoned good

No 2 From a Ewe yielding a fleece of  $2\frac{1}{4}$  lbs

No 3 From a Ewe yielding a fleece of  $2\frac{3}{4}$  lbs

No 4 From a Lamb, two months old

No 5 "*Shulakee*" This is the manufacture of Candahar, and is finer than that of the districts, on account of the threads being spun by the wheel instead of the twirling stone It is made in pieces of 25 inches by 5 to 10 yards long, Candahar measures, i e from 5 yards 2 feet 6 inches to 11 yards 2 feet, English measure, long

The price formerly was to  $2\frac{1}{4}$  Co's Rs per piece, but now it is to 6 Co's Rs It is worn as shawls or chuddurs

No 6 "*Bārāk*" Made from Hazarree wool, and manufactured in the Hazarree country, where it is called "*Bārāk-i-Sirkullee*," the size is 15 inches wide by 7 yards long, and the price 3 Co's Rs It is subject to a duty of 2 annas per piece Used as chogahs or cloaks

No 7 "*Bārāk-i-Bārai*" This is made from Lamb's wool by the Candahar Hazarrees, the size 15 inches wide by 7 yards long, price per piece 3-12 Co's Rs

No 8 "*Bārāk-i-Bārai*" of Cabul It is made also of Lamb's wool by the Cabul Hazarrees, in pieces 6 to 7 yards long, and sells at from 5 to 10 Co's Rs per piece

No 9 "*Barak-i-Bairi*" The manufacture of Ghuzni Hazarrees from Lamb's wool, size from 28 to 30 inches wide by 7 to 8 yards long, price from 2 to 5 Rs.

Besides these manufactures, there are carpets, grain bags, saddle bags, nummuds or rugs, felt cloaks, called kosahs, peculiar to Candahar, mittens, socks, and horse cloths.

No 10 Is a sample of the nummud, or felt, of which the "kosahs" are made

No 11 Is from Herat, and is very similar to what the Tartars of Hungrung and Spitū call "Birmore," but it is thinner, 16 to 18 inches wide by 6 to 7 yards long, price from 3 to 6 Co's Rs

No 12 Is a sample of wool taken from the wild sheep of Khorassan, and is added merely as a curiosity

Along with the foregoing samples, I have the pleasure to send

two specimens of the woollens manufactured in Kunawar and Tartary, to which I beg especially to call attention, as they are made from wool, which I am informed was rejected in the English markets

For remarks on the wool, sheep, and mode of trading with the Tartars, I must beg to refer to my Journal of a trip to Spiti

No 1 Is a sample of what the hill people call "Sooklout" It is made in Kunawur, at the towns of Soongnum and Kanum, near the head of the district, from wool of the Thibetan sheep It is said to be finest at Kanum In Soongnum the chief manufacture is blankets

No 2 Is a sample of a cloth manufactured by the Tartars of Spiti, chiefly for home consumption, from similar wool to the last

These woollens are very generally worn in the higher hilly districts, and are called "birmoree"

The cloth is made in pieces of about 18 inches broad, and varying in length from 6 to 12 yards, the pieces are generally sold in pairs, at 5 to 7 rupees, according to the quality and size This sample is reckoned good, and is taken off a piece of 12 yards At Simla a pair of these would sell (if procurable at all) from 14 to 20 rupees Both these are characteristic of the manufactures of Kunawar and Tartary They are good samples of what these rude people can produce from that *very wool* which was pronounced *bad*, and rejected in England some years ago, and to which allusion is made in my journey to Spiti

If such creditable woollens can be manufactured from Thibetan wool, by a *semi-barbarous people*, and by the *rudest machinery*, what might not be expected from the finished looms of Europe?

Nothing can show more clearly that mismanagement must have existed, than the quality of these very woollens prepared from the wool which at home was pronounced unservicable!

It must be borne in mind to, that these are made from unpicked wool, and that the wool itself is quite *uncultivated*, no attention being paid to the quality of the fleece of those males and females which are used for breeding Were attention paid to this point—and it probably would be were there a demand for the article—the fleece of the Choomoorte, or Thibetan sheep, would soon bid fair to rival, if not excel, the finest products of Europe

By a few judicious crosses with English rams or ewes, the breed might be made to undergo the dampness of a lower climate, and even-

tually become acclimated in England, and the wool of both be perhaps materially improved

*Candahar, 27th April, 1840*

N B Should leisure occur, I intend shortly to draw up a note on the culture of silk at Candahar, which I shall do myself the honor of forwarding

### *Proceedings of the Asiatic Society*

*(Wednesday Evening, 10th June, 1840)*

The Honorable Sir E. RYAN, President in the chair

The Proceedings of the last Meeting were read and confirmed

Lieutenant ARTHUR BROOME, Deputy Secretary Military Board, was proposed by the Officiating Secretary, seconded by Professor W. B. O'SHAUGHNESSY

Major R. BIRCH, Deputy Secretary to Government, Military Department, was proposed by the President, seconded by the Officiating Secretary

Read a letter from J. ALEXANDER, Esq. Officiating Government Agent, forwarding the Account Current of the Society's funds remaining in his hand on the 30th April last, exhibiting in favor of the Society, Government securities to the amount of Sa Rs. 10,000, and cash 742-7-1

The Officiating Secretary apprised the Meeting, that he has transmitted three Tibetan Manuscripts to Major F. JENKINS, for the use of his interpreter Mr. KEIENER, in prosecuting his studies in that language, as ordered by the Committee of Papers

### *Library*

Read a letter from F. J. HALLIDAY, Esq. Junior Secretary to the Government of India, Revenue Department, forwarding for deposit a copy of Nos. 15 and 16 of Dr. WIGHT's *Icones Plantarum Indiæ Orientalis*, or *Figures of Indian Plants*

Read a letter from H. V. BAYLEY, Esq. Assistant Secretary to the Government of India, forwarding for deposit, a copy of the work entitled, "*Chapters of the Modern History of British India*," received from the Hon'ble the Court of Directors

Read a letter from T. C. JARDINE, Esq. Assistant Surgeon, 2nd Light Cavalry, forwarding for presentation a copy of his publication, entitled, "*Catalogue of the Birds of the Peninsula of India*," and offering to lend his aid in promoting the laudable objects of the Society

The following books were presented

Malcolmson's *Clinical Remarks on some cases of Liver abscess*, presenting externally — *By the author*

*History of British Birds*, by Mr. Yarrel—*Purchased*

Naturalist's Library, *Mammalia*, vol. 9 *Dogs*

The Meteorological Register for the Month of April 1840, was presented by the Surveyor General

The following were received from the Booksellers —

Lardner's Cabinet Cyclopædia—

Bell's Poets, vol 2d

The Officiating Secretary laid before the Meeting a very curious table, drawn up by a Khattree at Delhi, which gave an account of the reigns of the various kings descended from Timoor, their possessions, revenue, &c &c

### *Literary and Antiquities*

The Officiating Secretary exhibited to the Meeting an Astrolabe, the property of Major POTTINGER

Resolved—That the Instrument be submitted to Mr MIDDLETON for his opinion, if he would oblige the Society with it

A collection of gems and coins of great interest was submitted by the Officiating Secretary, the property of Major POTTINGER

Read a letter from Lieut E B CONOLLY, forwarding impressions of coins, gems, and relics, from Herat

Read a communication from Major DAVIDSON, regarding the mode of dwarfing the pineapple

Resolved—That the communication be made over to the Agricultural Society

Read a letter from H V BAYLEY, Esq Assistant Secretary to the Government of India, transmitting for publication in the *Society's Journal*, the following papers —

Lieutenant Conolly's paper on Scistan

Copy of a report submitted to Government by the Committee appointed to investigate the Coal and Mineral Resources of India

Read a letter from Messrs THACKER and Co forwarding on behalf of Captain I S BURT for publication in the *Society's Journal*, facsimile of an Inscription taken in the temple at Odeypur, near Saugur

Memoir of Sylhet, Kachar, and the adjacent districts, by Captain FISHER, was presented in his name by the President

Read a letter from Lieut E B CONOLLY, forwarding his second paper on the antiquities between Mhow and Saugur

### *Museum*

The Officiating Secretary exhibited to the Meeting a fine specimen of cloth made by the Lepchas of Sikim The cloth appeared very much like *loose* cloth of Hindoostan

Several Zoological specimens were presented to the Society, as also a small collection of Himalayan game, and other birds, by the Officiating Secretary

### *Physical*

Memorandum on the differences of the meridian of the Observatory at Madras and the Flag Staff of Fort William, and of the cantonment of Futtyghur in the Doob, by Col J A HODGSON, late Surveyor General of India



Major POTTINGER forwarded a Meteorological table kept at Herat from the beginning of March 1838

Specimens of Bactrian camels', sheep, and goats' wool, with an account of its manufacture were submitted to the Meeting

Resolved—That after the paper was published in the Journal, the manuscript with the specimens be made over to the Agricultural Society

On the conclusion of the business, the Officiating Secretary apprised the Meeting, that a letter was received from Dr J McCLELLAND, claiming the arrears of his salary as Curator, at 150 rupees, for the month of May and up to 31 July 1839, and January and February of the current year, at the enhanced rate, viz 250 rupees per month, sanctioned by the Honorable the Court of Directors. The letter in question was circulated to the Committee of Papers, who recommended the subject to be discussed at the General Meeting of the Society

Resolved—That the Society sanction the payment of the first claim of Dr McCLELLAND at the rate mentioned by him, rupees 150 for May and June 1839, and 50 rupees for the two latter months, at the rate of which he first accepted the situation. It was also resolved, that the Society did not draw any money from Government as Curator's salary for the months of January and February of the present year, on the ground that they would have made over the amount to Dr McCLELLAND

### *Proceedings of the Asiatic Society*

( Wednesday Evening, 1st July, 1840 )

The Honorable Sir E RYAN, President, in the chair

The President rose and addressed the Meeting

Gentlemen,—I am anxious before any attempt is made to proceed with the business of the evening, to address a few words to the Members present. I am sure, I am anticipated by all, when I say I am about to allude to the irreparable loss which the Society has sustained in the death of its Secretary, the late Mr James PRINSEP. I shall not attempt to pass a studied eulogium on this distinguished person, that will be done on a future occasion, by those who are infinitely better qualified to do justice to his merits, than myself, and that such an occasion will arrive, you must most of you have been informed by the public prints, but I cannot be altogether silent, it would be unfitting the place, however unworthily, I hold amongst you, and it would but ill accord with your sentiments and feelings. It is known to you all, that for eight years Mr PRINSEP was the Secretary of this Society, with what indefatigable zeal, with what ability he conducted the duties of his office, you can indeed testify. The reputation which the Society now enjoys in Europe, I may with truth say, is mainly owing to his efforts. Amidst the most laborious public duties, he carried on a most extensive correspondence on literary and scientific subjects with Europe and Asia. He conducted the Journal of the Society, which he enriched by a variety of original papers, especially by his researches into the antiquities of India, in which his discoveries have attracted the admiration of all who have any taste for antiquarian research, leading to results the most important, and connecting, in truth, the histories of the east and west. I have prepared a resolution, expressing, I hope, in more accurate language than the words I have uttered,

ed, what I feel sure are the feelings of this Society, and I will propose it for your adoption. If the Society feels as I do on this occasion, the business of this evening will not proceed further. The resolution is as follows:

The Asiatic Society is desirous of expressing its sense of the great loss it has sustained by the death of its Secretary Mr James PRINSEP.

For a period of six years, in the midst of laborious public duties he devoted himself to the pursuits of the Society with unexampled assiduity and zeal. He carried on an extensive correspondence in Asia and in Europe. He edited the *Journal of the Asiatic Society*, a work containing the most valuable records of all that had been effected in Natural History, in Chemistry, in Geography, in Geology, in Statistics, and in the Language and Literature of the East, amongst these his own contributions form the most conspicuous part, and have been the means of raising the *Journal* to that high degree of celebrity, which it has attained, not only in this country, but in Europe, and all parts of the world.

His latter labours in decyphering the Pali inscriptions of Asoca, and in tracing through the Bactrian coins, the link between the histories of the East and West, have placed him in the foremost rank of those whose brilliant discoveries have enlightened and adorned the obscure path of antiquarian research.

To have a perpetual memorial of such a man among us, the Society solicits the aid of its Members, to place his bust by the side of those distinguished men who have preceded him.

The Honorable W. W. BIRD begged to second the resolution. It would be presumptuous in me to expatiate upon the labours of the late Mr PRINSEP, that is for the Society, for other members are far better able than myself to do the subject credit. But all, I will venture to express, will agree with me when I say, that as to those labours, with the numerous other avocations in which he was engaged, he sacrificed his life, it would be impossible for this Society to do sufficient honour to the memory of such a man.

Dr John GRANT.—If the last honored speaker deemed it presumptuous on his part to expatiate upon the labours and merits of the late Mr James PRINSEP, how much greater presumption would it be in me to do so at any length, nevertheless on so peculiar and solemn an occasion, I cannot reconcile it to my feelings to allow the resolution to pass in silence, without testifying, however imperfectly, to the worth of our departed friend. As a man of science and unwearying zeal, he could not be surpassed. Whatever he undertook he never gave up until he had either mastered the subject or satisfied himself that it was impracticable, truth in him found an active, energetic, and clear-minded advocate. Our excellent President has alluded to his labours in various walks of science in this country. He was a valuable member of the Society before he became its Secretary, and a frequent contributor to its publications and collections. It was said of Cuvier, that from a fossil fragment he could reconstruct individual specimens of animals no longer existing, so with James PRINSEP it might be said, that from a letter on a coin, he could trace a dynasty of ancient kings. The resolution before us was worthy of the Society, and of him, whose memory it was anxious to honour. But it was not solely as a philosopher and

cultivator of science, that we have cause to regret the heavy loss the Society has sustained, we have also to bewail him as a friend and member of the community. How loveable were his qualities, how sweet his disposition, which the warmth of discussion never ruffled, nor the acerbity of opposition soured. I cannot trust myself to say more, I feel quite unprepared to do so. I have merely risen to cast my humble sprig of rosemary upon the grave of our departed friend. Has not knowledge also her triumphs as well as war, died he not an heroic death in the breach of science, a martyr to his devotion in a glorious cause? To cite an often quoted but apposite sentiment—

“He was a man, take him for all in all,  
We never shall look upon his like again.”

Dr W B O'SHAUGHNESSY—It has been said, “out of the fulness of the heart the mouth speaketh,” but with me on the present occasion the reverse is but too true, my heart is too full to allow the expression of all I feel. As a physician, I knew well before his departure for England, what would be the result of Mr PRINSEP'S illness, and in order that the Society might secure some testimonial of so inestimable a man, I wrote to Professor WILSON, and begged of him to take steps for obtaining a bust for us. CHANTRY has seen Mr PRINSEP two or three times, and I have reason to think, that the ardent wishes of the Society, have already been in a great measure anticipated. I would beg to add to the resolution which has been moved, that at the meeting, which is to be held at the Town Hall, our office bearers be requested to attend as a deputation from our body, to accord with the homage which will be expressed on that occasion to Mr PRINSEP'S memory. This method has been adopted on such occasions, by the Academie Royale of France, and by the Academy of Berlin, &c. and with such precedents as these, we cannot go far wrong in following their example.

Dr GRANT seconded Dr O'SHAUGHNESSY.

Sir Edward RYAN—Gentlemen,—I proposed the resolution with an expectation that it would be the only one that would engage our attention this evening, and that in respect to the departed, and the solemnity of the event, this Meeting should be adjourned till a future day. With reference to what has been said regarding the expectation of our being able to obtain a bust, I am afraid from accounts that have been received in India, that we have not been yet successful. CHANTRY did visit Mr PRINSEP, but from several causes was unable to obtain a faithful likeness.

The best way, now in my opinion, to gain what we desire, would be, to send home a copy of the picture which is in the possession of Mr Charles PRINSEP, from which, with a little additional aid, I doubt not, we shall be able to obtain that we require.\* This call for a testimonial has been made upon particular members, not upon the Society in general, for I think it is not a subject for the Society to take into consideration—and I beg to propose, that such members as have veneration and regard for the late Mr James PRINSEP should now subscribe for the testimonial. I entirely concur with Dr O'SHAUGHNESSY in thinking that a deputation from our body should attend the Public Meeting of friends at the Town Hall.

The Meeting was then declared adjourned.

# JOURNAL

OF THE

## ASIATIC SOCIETY.

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*Points in the History of the Greek, and Indo-Scythian Kings in Bactria, Cabul, and India, as illustrated by decyphering the ancient legends on their coins.* By CHRISTIAN LASSEN, Bonn, 1838 <sup>1</sup>

We now proceed to apply the fourteen letters, thus defined, to the attributive epithets, met with on the legends. From this examination we shall derive some new letters, with which the names of the kings could not furnish us, and we may perhaps succeed by this in obtaining a more exact insight into the character of the language. But let us first sum up the results of the previous inquiry

The fourteen characters, above discussed, appear to me to be sufficiently confirmed (to aid us) in further decyphering. Twelve among them are consonants, which, however, do not enable us yet to define the system of consonants in the language. We therefore resort to the vowels. We have discovered the two simple vowels *a* and *ee* the first, when initial in a syllable, is expressed by an independent symbol, placed in the line itself; when following a consonant, it is not expressed by an independent sign, but included in the consonant. There is no peculiar sign for the long *a* The independent figure of *e* is not yet known to us; preceded by a consonant, it is denoted by a mark on the consonant, and it has likewise no peculiar sign, when long. It serves to express the

<sup>1</sup> Continued from p 276 vol ix

Greek vowels  $\epsilon$ ,  $\eta$ ,  $\iota$ ,  $\upsilon$ , while  $\alpha$  is substituted for  $\alpha$  and  $\omicron$ . We are also acquainted with an  $\hat{o}$ , the long sound of the Sanscrit, compounded of  $\alpha$  and  $\upsilon$ , which, however, when it concludes a word, loses so much of its value as to correspond with even an  $\omicron$ . It is always expressed by an independent symbol in the line. We have supposed by anticipation,  $\epsilon\epsilon$  to be of a similar nature with  $\omicron$ , but that  $\alpha\iota$  and  $\alpha\upsilon$  exist uncontracted, is to be doubted.

With regard to the language, as we know as yet too little of it, it will be best to put together our results at the end of the next paragraph. But for the system of vowels I think it most convenient to insert here a short disquisition.

$\epsilon$ ,  $\omicron$ ,  $\upsilon$ , not existing in the language, and the simple vowels being restricted to  $\alpha$  and  $\epsilon$ , it may be inferred, that the language upon the coins, as regards the system of its vowels, continued to exist (from of old) in the same undisturbed and simple state. Of simple vowels, we have to expect only an  $\omicron\omicron$ , and it seems even probable, that, when preceded by consonants, it was written in a similar way as  $\epsilon$ .

Mr Grotefend, by reading *Ukratidō*, imagined that he had discovered the initial  $\omicron\omicron$  in the name Eukratides; we may subsequently dispute this view. To find the  $\upsilon$ , preceded by a consonant, we must here discuss the name, Philoxenos.

In this name the second syllable is not  $\epsilon\iota$ , as it represents  $\lambda\omicron$  in Apollodotos, but in As Trans. vol. iv. pl. xx. No. 1., and No. 2 there occurs on both occasions one and the same symbol between *shinō* and the beginning of the word which has a  $\eta$ . It is but half preserved upon No. 1, upon No. 2., however, where we do not find any appearance of decay, a  $\dagger$  occurs, thus we may fairly suppose, that  $\epsilon\iota$  belongs at this place only to  $\iota$ , and  $\epsilon$  may be the symbol for  $\upsilon$ . R. R. II. No. 5 also is unfortunately much spoiled, yet, it is evident, that there was only one symbol between *shinō* and the beginning of the word, which can only be a well preserved  $\eta$ , on the other hand, in No. 6. between *shinō*, and the beginning of the word, we observe the following, IH, so that we should be inclined to suppose H to be substituted for  $\epsilon\iota$ , viz. for  $\lambda\omicron$ , and  $\iota$  to be K. Thus Mr. Grotefend has adopted. But as I shall assign to K an entirely different figure, which

cannot have occurred before  $\varpi$ , either upon this coin, or upon the others of Philoxenos, I must maintain, that the native orthography had no K at all in the name. But supposing, the line l belonged to the preceding H, and that there must have been a  $\tau$  there, which in this form cannot be H, I can only admit, that the cross line was half corroded, while both final lines were too much protracted, in a word, that we must recognize here, Mr. Prinsep's figure,  $\tau$ .

The assertion, that the second symbol in the name of Philoxenos,\* which I restore thus,  $\text{P}\varpi\tau\tau$  is *lu*, is at variance, however, with the more common mode of representing the omicron by an inherent A. We think this objection so important, that we shall adopt  $\tau$  for *lu* at first only in the way of conjecture. It is countenanced only by the name Agathokles, written in the old Sanscrit character, which is rendered *Agathukla*, and consequently the authority exists in at most only a contiguous language. With more confidence we maintain, that the natives did not retain the k in the name of Philoxenos, and in that case an absorption of k with the sibilant must have taken place. There is, however, no analogy with this absorption in the Prâcrit, here x ( $\text{𑀅}$ ) is altered into kkh ( $\text{𑀅𑀭}$ ), the language of the coins does not always follow the rules of absorption in Prâcrit, this is proved by *hermajô*, it does not abound, as the Prâcrit, with reduplicated consonants, this is proved by Apollodotos, which is expressed *Apaladatô*. We must therefore look out for other analogies, and here the Zend supplies us with the very striking fact, that it often substitutes sh for  $\text{𑀅}$  (ksh) of the Sanscrit. Thus *dashina* (the right) for *daksina*, *ashu* (eye) for *akshu*. I therefore conclude  $\tau$  to be sh (sch).

But why should this sh occur in Lysias, which has but the s in Greek? I shall be perhaps reminded, in answer, of the Sanscrit rule which might have been originally observed in the Zend, according to which s, preceded by any other vowel than a,

\* Mr James Prinsep's last reading of this peculiar name from the Bactrian legend was as follows,  $\text{𑀧𑀺𑀭𑀸𑀓}$  *Phila-senasa* or *Philasnasa*. See page 652, vol vii July, 1838. It is this name and that of Lysias that proved the  $\tau$  to be an S.—H. T. P



PAO upon the Kanerkes-coins, and he was in consequence compelled to admit some spurious forms of *n*, resembling the shape of *r* and *t*; his alphabet exhibits five of them. Mr. Prinsep supposed them to be repetitions of the word *Malakádō*. Both of them, I think, will admit the refutation on previous grounds. By the term *Mahárádō* the simple title, βασιλεύς, is always expressed, and it is remarkable enough, that the simple word *rádan* never occurs for it. The Greeks were satisfied with the plain title βασιλεύς; this term Menandros and the Greek Kings ordinarily make use of. Eukratides alone affects the prouder title ΒΑΣΙΛΕΩΣ ΜΕΓΑΛΟΥ, for which *Mahárádō* appears to be the adequate translation. It certainly may be so according to original meaning, but scarcely according to the real interpretation of the word; for *Mahárádō* was already so much worn out by use, that it was of no more value than the simple king. Many an insignificant chieftain thus styles himself in Indian inscriptions, and the degradation of the term has so increased, that many private men at present claim this title, as for instance Rammohun Roy, who was so called, and a *Mahárága* is as common in India, as a *principe*\* in Italy. Eukratides (whether *the second*, or not, shall here be left undiscussed) was certainly aware of the difference in the acceptation of those words, if he have also titled himself, according to the drawing of Masson (and not according to the represented coins†) upon some specimens 𑀧𑀺𑀭𑀺𑀭𑀺 𑀧𑀺𑀭𑀺𑀭𑀺, “the great king, the king of kings.” As then *Mahárádō* was of less value, than it was as originally compounded, the explicit addition of the term “*great*” to Azes after the words, “*King of Kings*” is less tautological, than it appears at the first glance.

The compound word *rágárádō* corresponds to βασιλέως βασιλέων. These words (*māhārádō* *rágárádō*) may both be Sanscrit as well as Prâcrit; for as used here, the Sanscrit would

\* *As. Trans* iv p 338

† If the definition of an Italian *principe*, “something less than an English Esquire,” is correct, Mr Lassen is certainly out in his estimate of the common usage, to which *maharaja* is put. It is only in Bengal and Behar, that the title may be termed degraded to the use of private men. 卐



change the nominative as into ô The variety *râgâdirâgô* contains a remarkable mistake in orthography, the word *adhurâga* "Supreme King,"\* often met with in the titles of Indian Kings, has dh, not d Whether the stamp-cutters in Azes' time, perhaps not often natives, did not pay much attention to the proprieties of indigenous grammar, or whether the language itself confounded both sounds, d and dh, I shall not pretend to decide, there will hereafter indeed occur some other examples of the same substitution.

*Mahatô* (great) compels us to declare the language of the coins a variety of Prâcrit. The Sanscrit nominative is *mahan*, the Prâcrit nominative *mahantô*, the terminal ô at this place proves also, that the alteration of as into ô occurred in all instances, as in Prâcrit The writing *mahatô*, by exhibiting the same omission of n, as occurred in *Atimakho* for Antimachos, proves, that it is not the pure Indian Prâcrit, but a dialect, approaching also to the old Persian; for when the arrow-headed inscriptions render *gadârd*, hidhush† for *gandârâ*, hindush, there is the same exsection of n, when followed by dentals, or properly an absorption, when n is rendered like the succeeding letter, thus the Byzantines said *Kaddakootzen*, instead of *Kantakootzen* The language of the coins, however, like the Zend, has no reduplicated consonants, consequently not *mahattô*.

The constant epithet ἀνίκητος, is very distinct upon the Philoxenos coin (As. Trans. Vol. iv Pl. xxi No. 1.) פֿרֿלֿהֿתֿ, † *Apalhatô*. *Apratihata* signifies in Sanscrit *non repulsus*; the preposition *prati* often becomes in Prâcrit *pah* § We have consequently got another Prâcrit form of quite unexceptionable interpretation Νικηφόρος and νικάρωρ are expressed by the same word See the coins of Amyntas (As. Trans. Vol. v

\* *Atrâg'a*, being not in use for this title, I shall leave it undiscussed, if there it must not be read 𐎠 𐎢

† According to Mr Beer's correction, I have much pleasure in availing myself of this opportunity to thank him publicly for his solid and instructive, as well as kind, critique of my work on arrow-headed writing

‡ Mr James Prinsep reads this epithet *Apavihatasa* \*\*, and this פֿרֿלֿהֿתֿ *Jayadharasa*

§ My C'mmar, iv 5 0

Pl XLVI No 1) and those of Archelios, at the same place (Pl xxxv No 1). Farther evidence is superfluous. It is represented in the native language by  $\text{𐎧𐎡𐎴𐎠}$ . The letter, yet unknown, can be only v, and the word *gájavató* (the victorious,) according to the same form as *maható* for the Prâcrit *gajavantó*, Sanscrit *gajavan*, in the accusative, *gajavantam*

We have therefore acquired v,  $\text{𐎧}$  (as our 15th letter )

The word, substituted for  $\delta\iota\kappa\alpha\iota\omicron\varsigma$ , commences with a symbol yet unknown (As Trans iv Pl. xx1 No 9 v pl. xxxv. No 6 No 1.\*) The second syllable is every where  $\omega$ , m, after it follows a yet undefined letter, and then  $\hat{o}$

The first has the form  $\epsilon$  or  $\text{𐎧}$  upon the two coins, first mentioned, upon the last coin the same sign, but reversed, so as almost to resemble  $\text{𐎧}$ , and it is probably only incorrectly drawn, though Mr Prinsep from the Archelios coin and from one coin of Azes, who likewise assumed this title (As. Trans iv Pl. xxiii No 22 v p. 549 ) has chosen this figure for the print † It will be safer at all events to take the other

As I think, I have proved, that we have to look for Indian words upon the coins, it evidently follows from the second syllable that  $\text{𐎧𐎡𐎴𐎠}$  must be read, *dhāmiko* (the just); in Prâcrit *dhammikó* or *dhāmikó*, in Sanscrit *dharmikas*. The  $\hat{a}$  is here again unwritten, and the consonant is not reduplicated according to the already stated peculiarity of the language of the coin; the union in one character of r m accords quite with the rule of Prâcrit, while the retention of the r in *Hermajó*, is certainly to be accounted for (as before noted) by the authority of the king Hermaios, who would not allow his name to be corrupted. What I have further to prove, are the two new letters, on k, I shall speak hereafter, I will now discuss our 16th letter  $\epsilon$  or  $\text{𐎧}$ , dh.

It appeared already from former remarks, that the second n is not met with in the name Menandros. Now we know,

\* R R 11 No 9 is indistinct

† The Azes-coin, however, according to the representation, is not well preserved, or not precisely copied by Mr Masson, for the last letter also is wrong  $\text{𐎧}$  for  $\text{𐎧}$

that the native language did not admit an *n*, followed by dentals. Mr Prinsep read *Minanô*, as the penultimate symbol is indeed very similar to the *n*, already discussed. It is thus upon the coin (As. Trans. v Pl. XLVI. No. 6,) where no error appears to have occurred  $\text{P}\xi\epsilon\omega$ , and I should not hesitate to read *Minanô*, were it not evident, that by the law of the language the *n* cannot be retained in Menandros, and were not the omission of *dr* at variance with the rules of the absorption of consonants.

Mr. Grotefend's supposition, as it appears from his Hebrew paraphrase  $\text{מננ} [\text{דרע}]$  is deficient, in that the termination *ô*, which he improperly puts also between brackets, occurs often enough to prove, that nothing is omitted before it. I do not therefore know, how he can read Menandrô, for the coins he used, have no more symbols than the others

It is only fair, however, to add, that the letters of the coins (R R I. No. 8, 9, 11) have become so indistinct, that, with regard to the name, nothing can be decided from them. No 10 renders, in apparently well preserved characters,  $\text{P}\text{r}\epsilon\omega$ , which we might read *Mitarô* or *Mitadô*, but the  $\text{P}$  upon the coin is certainly spoiled. Not to judge too arbitrarily, I shall leave it to a renewed investigation, if there occur two orthographies of that name.

By comparing the remaining copies we observe, R. R. II No. 12. has still the *n*, though mutilated, then  $\epsilon$ , and lastly  $\text{P}$ . Even upon Tod's coin, No. 2, quoted by Mr. Grotefend, the terminal letters are also obviously  $\text{P}\epsilon$ , the preceding letter is entirely misdrawn. As. Trans. Pl. xxvi. No. 2. distinctly renders  $\text{L}$  in the form, above established, and the final letters are again  $\text{P}\epsilon$ . Consequently  $\text{P}\epsilon\text{r}\omega$ , No. 3 is no less distinct, the  $\text{r}$  has an additional point, as at R. R. II. No. 12, As. Trans. v. pl. XLVI No. 8 has  $\text{P}\epsilon\epsilon\omega$ , with two points. At the same place, No. 1 gives  $\epsilon$  with the point, but afterwards an *n* of the same form, but without the point. Thus also v. pl. XLVI. No. 6.  $\text{P}\epsilon\epsilon\omega$ .\* Finally at the same place No. 9 and No. 5 have for these two  $\epsilon$ , two  $\text{r}$  viz.  $\text{P}\text{r}\text{r}\omega$ , save only, that No. 5 is more indistinct and corroded.

\* Mr James Prinsep has two readings for the Bactrian legend of Menander-coins, viz  $\text{P}\epsilon\epsilon\omega$  Menanasa and  $\text{P}\epsilon\text{r}\omega$  Medanasa.---H T P

Here we therefore indeed observe an inconsistency in the characters, which depends not simply upon the state of the coins, while from the addition of variously situated points with both letters, we may presume, that the indistinctness was to be amended by additional diacritical symbols. This idea as to the points, cannot be established but by carefully examining the coins themselves. The point at ʾ serves perhaps to distinguish it from ʾ, 1

Be it as it may, it is evident from our review, that some coins obviously distinguish the second symbol from the third. As now 1 by the omission of the cross line below, and by a greater curvature in the middle, may easily be altered in the figure ε, nothing prevents us from supposing, that the second syllable may still be 1 or *na*

The penultimate symbol, being proved so incontrovertibly as n, ε, I do not hesitate to declare it the above adopted dh ε. In the word *dhāmikó* we observed also instances, showing that ε has a straight form ʾ, and this approaches so much to n, that we can hence likewise account for the confounding of both.

For 1 we never meet with a peculiar symbol, and the name must therefore be read *Minadô*. The adoption of ε as dh, will lastly be confirmed by the fact, that in the same word it is commonly written ʾ, and seldom ε. The ʾ upon the coin, R. R. I. No. 10, appears to be indeed confounded in the reversed way, viz ʾ for ε. But ε if it be a dental sound, *dhāmikó* decides for the adoption of *dh*.

In *Minadhó* r is absorbed, according to rules of Prâcrit, for instance, *kundras* becomes *kando*. As ε for d appears to be the rule in Menandros, we cannot consider ε to be substituted by mere chance for ʾ, but it must be founded upon the nature of the language. We may here recall to mind the rule of the Zend, according to which the Sanscrit *putra* is changed into *puthra*. The omission of the 1 may have had an effect, similar with the Persian *sur*, (*si*, or three) which presupposes a previous form *thi*, the *th* of which still remained, after *r* had disappeared out of the more ancient form *thri* in Zend for the Sanscrit *tri*.

We have in *Minadhó* for Menandros an evident instance,

that the language of the coins followed its own principles, in the paraphrase of Greek names. I would notice at the same time, that we may expect a similar kind of absorption in Eukratides, and we can already hypothetically maintain, that r, preceded by consonants, was absorbed

R before consonants is likewise absorbed, as in *dhāmikó*, and we undoubtedly have properly attributed to foreign authority the deviation from the rule in *Hirmayó*. If the name Archelios were precisely represented in the native writing, it would supply us another opportunity for testing the rule for r. The name of this king is certainly written thus, and not *Archelaos*, if the Greek be properly represented, and the native legend, according to the only copy, As Trans v pl xxxv. No. 1, be properly rendered by Mr Masson. The Greek legend is distinct. ΒΑΣΙΛΕΩΣ [ΔΙΚΑ]ΙΟΥ ΝΙΚΗΦΟΡΟΥ ΑΡΧΕΛΙΟΥ; the native legend is similar, save the name, which is in the copy entirely illegible. M<sub>1</sub> Pinsep, however, renders this also, according to M<sub>1</sub> Masson's drawing. I copy the whole  
 ԻՆԴՆ ԲԴՅԱՅ ԲԻՍՅ ՔԱՆՆՍ

Leaving the name for the present, we may assert, on the authority of the other examples, that the initial of the second word is incorrectly given, it must be ε. The legend will consequently be *Mahdrágó dhamikó qajarato*, the supreme King, the just, the victorious.

In the name itself Ի is evidently an error for Լ, li, as *Lashyó* for Lysias, for where there consequently was only one symbol. If Mr Masson has correctly copied, it is there *Ahalyó*. But as ε (epsilon) must be expressed by e, it follows, that the second letter has not been completely preserved, and I do not doubt, that it was ʀ, chi, khi. But there is no trace whatever of r, and we have again an absorption of r before other consonants. If Archelios was termed in the native language *Akilyó*, his pride was perhaps gratified, as being reminded of the name of the great Pelide, so that he would not much object to the rule.

The most difficult title, that namely, by which *σωτήρ* is

translated, is still left to be discussed. It too terminates in ô, but there precede three symbols, which belong all to t, d, ñ, letters so easily to be confounded, though Mr Prinsep,\* who, however, observes the ambiguity, has taken it for k. Among all the readings, *rakakô*, *radakô* *radadô*, which can be taken on his conjecture, he chooses *rakakô*, because the Sanscrit word *rakshaka* denotes *protector*, and because (he does indeed not expressly mention this, but it must have influenced his decision) its form in Prâcrit is *rakkhakô*. Though I could mention several other objections to this interpretation, suffice it to say, that there is no k to be met with in the word. For the same reason we cannot adopt the word *târaka*, supporter, deliverer.

M<sup>r</sup> Grottefend started on the supposition, that it was the same with KOPANO, which occurs upon the Kanikes-coins. Besides, however, that this word may have belonged to a dialect, different from what we have hitherto discussed, the same objection will also be decisive, neither the n, here assumed, nor the k can stand the test.

After having compared all instances of this word upon the coins of Menandros, Apollodotos, Diomedes, Heirmaios, it remains doubtful yet, as for what we can take the three first characters of the word, we may read 𑀲𑀸𑀓 just so, according to the coin which we choose as a criterion for those three letters.

A hint appears in the following. We observe different orthography of this word upon coins, which certainly belong to a later period, and the words on which seem to intimate an altered state of the language, as upon the coins As Trans Vol IV Pl XXIII No 23, where the Greek legend exhibits ΒΑΣΙΛΕΥΣ ΒΑΣΙΛΕΩΝ ΣΩΤΗΡ ΜΕΓΑΣ, so also upon the coins of the unknown king, who usually has only Greek inscriptions;† fortunately we can easily read a portion of the native legend, it is thus 𑀲𑀸𑀓𑀲𑀸𑀓𑀲𑀸𑀓𑀲𑀸𑀓, therefore, *mahatô* — *adharô mahârdgô*, to this there probably succeeded *āgarāgô*, but this part is no longer legible. ε is the second character in

\* IV 335

† The king too is on horseback, as upon the purely Greek coins of the great deliverer, this accords with the monogram. See at the same place No 26. The reverse is different.

the word we are in search of, it will therefore be in the usual form a 𑀓 or d. Now the word is thus written upon the Yndopherres-coins 𑀧𑀲𑀸𑀓, dh standing here too for the first letter.

Before recognising these representatives of the first two signs\* of 𑀧𑀲𑀸𑀓, I had asked myself, by what word *σωτήρ* would be expressed in Sanscrit? The question was easily answered, it could only be *trātri*, nominative *trātā*, accusative *trātāram*, the nominative in Prâcrit is *tādārō* for this,† thus 𑀧𑀲𑀸𑀓 was without difficulty to be read. The reading, discovered afterwards, 𑀧𑀲𑀸𑀓 confirmed this interpretation. For want of a more exact knowledge, 𑀸, dh, was substituted for d 𑀸 in the first syllable shows a state of pronunciation, still more corrupted, but otherwise it is an acceptable confirmation, by establishing the dental sound of the beginning.

In the Prâcrit of the dramas, the initial t usually retains its class (as a letter) while the t, included by other letters, is generally subdued (as a sound) to d, I find in 𑀧𑀲𑀸𑀓 this transition of t to d, without asserting, however, that this form of the d had been adopted upon the older coins. He that still adheres to the reading of *tādārō*, can only be opposed by reasons, not to be derived from the characters. The form 𑀧𑀲𑀸𑀓 which reduces the initial also to dh, refers to a still later period of the language.

I think, I have sufficiently explained the usual epithets and titles, and I may now be allowed to survey the principal results.

The language has apparently manifested a strong bent to the Prâcrit of the dramas, by its absorptions and by forming new, short forms of A from the long ones, the nominatives in ô, as belonging also to Zend, prove nothing (as regards Prâcrit affinity) words as *râgan* and *dharmo* are so undoubtedly Indian, and not Zendic, that the relation of the language to India is quite evident from them, also *gaja* for victory, and *tādārō* for deceiver (though I shall not deny, that the latter belongs to the Zend) are entirely Indian roots.

\* Mr James Prinsep's last reading of this word was 𑀧𑀲𑀸𑀓 *Nandatasa* — H T P

† My G. Aumar, p 291

But we should be wrong in not confessing, that some traces referred to a dialect, not merely Indian, as, for instance, the omission of *n* before *t* and *d*, and the want of reduplicated consonants, even when they were required for the foreign word, as Apollodotos. The latter fact does not accord with the Piâcrit, where nothing is more frequent than *ll*, *mm*, and others. The former, though not Zendic, is old Persian, and the language of the coins seems to occupy a place midway between the old Persian and the Indian languages.

It is now incumbent on me to vindicate the opinion I have adopted regarding *k*, in opposition to both my predecessors, in effecting which I shall discuss the names of Greek Kings, not yet examined, which will prove instrumental in fixing the alphabet.

#### § 4

#### *Inquiry into the Alphabet from the names of Greek Kings Continued*

Mr Prinsep as well as Mr Grotfend, obtain their *k* principally from the name Eukratides, the latter represents it in the form  $\neg$ , according to the former, it does not differ from *d* and *r*. The name Eukratides induces the following dilemma,—whether we suppose the diphthong *ε υ* to be expressed by one or two letters, both succeeding letters are displaced. No one has supposed the case, that *r* was perhaps omitted, though it is evident, that according as it is expressed or not expressed, *k* must occupy another place. Mr Grotfend read *Ukratidô*, Mr Prinsep *Eukratidô*.

To arrive at the real *k*, we shall pursue a different course.

The *k* I adopted in *dhâmkô*, is exactly  $\neg$  upon the coin of Archelios, upon another at the same place, *v* Pl xxxv No. 6,  $\neg$  is substituted for it, so that the right half of the letter does not occur, upon the copy iv Pl. xxi No. 9, the symbol is destroyed, also in R. R. II. No. 9. But that  $\neg$  is the real, complete figure, follows from a remark of Mr. Prinsep\* who notices, that upon a coin of Azes (iv. Pl. xxiii No. 22,)  $\neg$  distinctly is the penultimate symbol of the word, denoting *just*.





the drawings of M<sub>1</sub> Masson represent this wise the name  $\text{קנחלרר}$ . But as the k in this very name Eukratides, was entirely misunderstood formerly, I may be allowed to proceed a little more cautiously I shall therefore place the different characters, yet preserved, of four edited coins, one under the other As. J Vol iv Pl xxv No 8 has  $\text{רנדרר}$

|       |   |   |   |   |    |   |                |
|-------|---|---|---|---|----|---|----------------|
|       | ” | ” | ” | ” | 9  | ” | $\text{כזבר}$  |
|       | ” | ” | ” | ” | 10 | ” | $\text{קרררר}$ |
| R R I | ” | ” | ” | ” | 7  | ” | $\text{ררררר}$ |

The last half consequently is *tidó*, three characters only precede it The third among them is decidedly not r Two legends exhibit the k, already known to us, one gives the k ( $\text{ח}$  for  $\text{ר}$ ), and a fourth decides nothing, as the legend is evidently spoiled. R is therefore omitted, as in *Minadó* for Menandros

If therefore\*—*katidó* is to be read, M<sub>1</sub> Prinsep is quite right in stating, that two symbols precede k, but I do not know in this case, how he obtains his r M<sub>1</sub> Grotefend proceeded carefully by adopting one character only for  $\epsilon\upsilon$  in order to get k<sub>1</sub> He must therefore take k for  $\text{ר}$ , the  $\text{כ}$  for k, and  $\text{ר}$  for a simple vowel, while the initial letter, according to him, represents u Thus is it in his alphabet, but I hope, I have convinced him of his mistake

In interpreting the two first characters, I shall not begin by inquiring, in what manner the diphthong  $\epsilon\upsilon$ , foreign to those languages, might have been expressed, as to its being foreign, I think, it is already inferentially proved in the previous remarks. As  $\text{ר}$  is rendered by  $\text{ר}$ , I shall adopt  $\text{כ}$  or  $\text{ר}$  as  $\text{ר}$ , viz. as the sign of this vowel, when commencing a syllable Though this is not here the case, yet there was no other expedient in the system of

\* M<sub>1</sub> James Prinsep's last reading of this name was as follows —

Lukratidasa  $\text{כררררררר}$   $\text{ר}$

$\text{ר}$  c

$\text{כ}$  u

$\text{כ}$  kr

$\text{ר}$  ti

$\text{כ}$  d

$\text{כ}$  s

Lukratidasa, See Journal for July, 1838 ---H T P

the native language, unless the writing *Ejakatidó* were chosen, but it was more natural to write *eikatidó*. By this paraphrase I acknowledge, that with Mr Prinsep, I take ʾ for ê, viz for a long ê, which was not confined to denoting the never shortened vowel of the Sanscrit, but which also expressed the lighter one of the Prâcrit, and which, as the analogous ô, ॡ, probably had its constant place in the same line with the consonants. The reason, that e in *ékatidó* is not, as usual, expressed by ı, appears even to have proceeded from the impossibility of approaching the foreign sound in any other way, than in that, above mentioned.

With regard to the last two of our three new letters, we shall call to mind, that they still have to be confirmed (17,) ʾ, k (18); ɔ, ı, (19,) ʾ, ê.

Again k seems to occur in a name, hitherto obscure, and which even now cannot be entirely illustrated.

The Agathokleia-coin offers the unexpected and pleasing fact of a Greek queen in that remote quarter of the East,\* upon its one side we observe a helmeted head, whether of a woman we shall leave undecided, with the legend, ΒΑΣΙΛΙΣΣΑΣ ΘΕΟΠΡΟΠΟ(Υ)ΑΓΑΘΟΚΛΕΙΑΣ. If we now look upon the reverse for an interpretation of the unusual and obscure epithet of the queen, we find the representation of a sitting Hercules, who appears with the left hand to hold the lion's skin, and with the right perhaps leans on a rock, as upon the coins of Euthydemus, where, however, he holds with the left the club. While in expectation of the translation of the Greek legend, we are surprised at the word;† ΠΑΓΛ(Υ) *mahá-rágó*. We know the language sufficiently to assert, that it, like the Prâcrit, has not used the masculine termination for a queen. There is therefore the title of a king. Then follows ΠΑΓΛ(Υ) *táddá ó*, deliverer. Two testimonial instances prove, that

\* As Trans V Pl XLVI No 2

† *Maharajasa* according to Mr James Prinsep, who particularly remarks, that the masculine word is used. The word after *Maharaja* he suggests may profitably be read *Devamatasa*, which is an exact translation of ΘΕΟΤΡΟΠΟΥ --- II 1 P

the Greek titles are not repeated on the reverse, and we therefore cannot derive any advantage from discussing them here.

After *mahdrâgô tâddârô* we expect the name of a king, which must be contained in the symbols  $\text{P} \text{r} \text{x} \text{P} \text{h} \omega$ .\*

The writing does not compel us to divide the word in two, as Mr. Prinsep proposed, because  $\text{P}$  is placed in the middle.

The second letter, if properly drawn, can only be k, and there is no room for doubt on this point, as the coin itself was in the hands of Mr. Prinsep. The fourth character, though most closely approaching the form of dh, may likewise be taken for an n; it is accompanied by ee. Mr. Prinsep indeed substitutes for this the figure  $\text{x}$  in his print, but on the coin it is such as I represent it.

The† initials being therefore *Mikô*, may correspond with the Greek  $\text{Μικω}$ ,  $\text{Μεκω}$ ,  $\text{Μηκω}$ ,  $\text{Μυκω}$ . It appears probable, that the next letter of a Greek word is rather n than dh, which would be only substituted for d. We lastly meet with  $\text{P}$  and the unlucky letter  $\text{r}$ , which may be taken for t, d, or r, and affords a beautiful opportunity for a guess.

Since *Μεκ* is not the beginning of any Greek word, and no king is likely styled *Μηκωνῆς*, the initial letters must certainly be *Μικω* or *Μυκω*; we cannot say much in favour of *Μικ*, even if we would look for an absorbed r in the native character, viz *Μικρω*.

We therefore come to *Μυκω*, and here *Μυκῶνιος*, from the island Mycone, appears of itself, *Μυκωνίδης* is indeed not a Greek name, otherwise known, though it would be least objectionable to read in this way the native characters. If  $\text{r}$  were allowed instead of  $\text{h}$ , we should obtain *Myronides*, who would be admitted with much less opposition as a king, not yet known at the Indus. But not indulging such a supposition, merely arbitrary, we do best to wait for further discoveries.

\* Mr. James Prinsep reads  $\text{P} \text{r} \text{x} \text{P} \text{h} \omega$  the name here referred to Faka-saqltasa.—H T P

† Mr. James Prinsep's discovery of the letter  $\phi$ , as equivalent to the Greek  $\phi$ , resolves the difficulty, felt by Mr. Lassen, at finding, what he read as  $\omega$  me at the beginning of the name of Agaihoceleia. In this word it is apparently the equivalent of the Greek digamma.—H T P

As the native name does not recall elements of Persian or Indian words, we shall by no means attempt to obtrude a barbarian husband on the noble Agathokleia

### § 5

*Continuation—regarding the names of Kings, not Greeks*

I now pass to the coins of Kings, not Greeks, to complete the native alphabet, and to advance our knowledge of the language from their legends

Azilises presents a new symbol As T. IV pl XXIII No 27 No 28 R R II No 20.  $\Upsilon$ , almost like an  $\hat{e}$ , the Greek denotes the same by an  $s$  We have already another  $s$ ,  $\nabla$ , which we take for  $sh$ , and will discover a third  $\Gamma$  We must therefore choose  $z$  or  $s$  for either of them. Besides, it is possible, that  $s$  in Azilises is substituted in the Greek translation for a  $k'$  (tsch)  $\Upsilon$ , as this sound was not original in the Greek, and was adopted as  $\tau\zeta$  at a later period only It is therefore a mere arbitrary reading, when I take conjecturally for our 20th letter  $\Upsilon$ , as  $z$

The Parthian king Vonones, has the Greek legend, ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΜΕΓΑΛΟΥ ΟΝΟΝΟΥ.\* This follows from the coins R. R. II No 10, No 11, I. No 20, where, according to the native legend, however, not ΜΕΓΑΛΟΥ, but ΔΙΚΑΙΟΥ must have been written, for we observe upon the reverse still  $\Psi\eta\psi\epsilon$ , as also in As. J IV pl XXI. No 5. Though we do not know yet any copy, exhibiting the entire title, we can confidently construe it by comparison The reverses also give us nothing but fragments of the native legends, we must, however, have recourse to them to obtain the name. R. R. II. No 10 has  $\Delta$  over the right arm of Jupiter, and the letter, next following, seems to be a disfigured  $\Psi$ , it then would be  $g\acute{o}$  the end of *Mahárágó*, for the succeeding illegible word has five characters, and is therefore  $\Psi\Delta\Gamma\Delta\Gamma$  *rágárágó* It would be indeed singular, had *great* preceded the other titles. But it appears

\* The Arsakides-coins also combine both titles, as those that are attributed to the twelfth (of those kings) or Phraates III, Eckhel III, 528 ΒΑΣΙΛΕΩΣ ΒΑΣΙΛΕΩΝ ΑΡΣΑΚΟΥ ΜΕΓΑΛΟΥ ΔΙΚΑΙΟΥ ΘΕΟΥ ΕΥΠΑΤΟΡΟΣ ΦΙΛΕΛΛΗΝΟΣ.

difficult to decide any thing by the instrumentality of specimens, so defective. The specimen R. R. II No. 11, commences regularly with *mahārāgō rāgārāgō ma(hato)*. The name does not occur on either side R. R. I No. 20, when *māhārāgō* is scarcely to be distinguished, but evidently has over the head of Minerva  $\text{𐎧𐎡𐎴}$  (ε,) *dhāmikō*, then follows the name,\* As T. IV pl. XXI No. 5 has  $\text{𐎧(𐎡)𐎴(𐎧)𐎡}$ , probably (*mahārāgō rāgārāgō*)

\* The same also upon a coin of Mr. Masson, As. T. III pl. XI No. 43,

1  $\text{𐎧 𐎡 𐎴 𐎧}$

2  $\text{𐎧 𐎴 𐎴 𐎧}$

3  $\text{𐎧 𐎡 𐎴 𐎧}$

are read by Mr. James Prinsep, *Spalaha'rasa*, *Spalafarmasa* and *Spalārīshasa*, and with reference to this part of Mr. Lassen's treatise, it may be as well to give from a letter of Mr. Lassen's to that gentleman, dated 30th December 1838, and which reached India after Mr. James Prinsep had left, never to return, the following extract, showing the opinion of Mr. Lassen, after reading the article referred to—"You will soon receive a little treatise of mine in which I have endeavoured to show amongst other things, relating to the Bactrian or Indo-Scythian part of Indian history, that the alphabet of the Bactrian-coins was only in use in Kabulistan and the Punjab, and ought therefore to be called Caboolan, my book is unfortunately written in German—I say unfortunately, because I should wish to hear your opinion on this and other views of mine. Will not M. Csoma Dekoros do me the favor to be my interpreter? Your additional corrections of the alphabet are very valuable, particularly the  $\text{𐎧}$  as s. So also your *Jayadharasa*. I suspect, that Nikatoros will turn out to be Jayavatasa, the translations being so literal, and we ought to expect two terms  $\text{𐎡 𐎴}$  as different from  $\text{𐎡 𐎴}$  and in my opinion  $\text{𐎡 𐎴}$ . I have in my late reading attended much to the use of the different compounds of *pata*, and am persuaded, that only *apratihata* would be used for unconquered, *Apatihata* is in fact the very Prakrit form. For shortness sake, let me only state as a conjecture, that  $\text{𐎡𐎴𐎧𐎴𐎧𐎴}$  is *tādārāsa* from  $\text{𐎡𐎴𐎧𐎴}$  on the coins of Andapherres. *Tādārāsa* or *dādārāsa* the ε being  $\text{𐎡}$  also in Minadasa. Not to be forgotten, is your *Spalahara*, a capital reading that destroys with one blow, all our lucubrations on the data of VONONES. It is evident, there was a Kabulian dynasty of *Arsacidae*, coeval with that of Azas. I only propose to read  $\text{𐎧}$  differently, as it cannot well be a compound of s and  $\text{𐎧}$ . May it not be a modification of k  $\text{𐎧}$ , corresponding with the Zend  $\text{𐎧}$ , which takes the place of  $\text{𐎧}$  in Sanscrit? Spalyrius by the Indians was called Svalyrius, which the Greek alphabet expressed by  $\text{𐎧𐎴}$ . The Kabulians who called the river  $\text{𐎡𐎴𐎧𐎴𐎧𐎴}$  Shushva Choaspes, pronounced the king's name Shvalyrius or Galyrius."—H. T. P.

*mahatō*, as it will also have been upon R. R. II. No. 10, and then the name

The state of these coins does not much invite inquiry after the name; but it being better preserved, than the rest of the words, we shall venture on the task.

|                        |            |              |
|------------------------|------------|--------------|
| As. Trans. IV. Pl. xxi | No. 5, has | 𐎧𐎶𐎵𐎺𐎠        |
| R. R. II. No. 10       |            | <u>𐎧𐎶𐎵𐎺𐎠</u> |
| „ „ I „ 20             | ..         | 𐎧𐎶𐎵𐎺𐎠        |

Mr. Grotefend has read it *Vonohno*, it will be observed, the two n do not correspond, nor with the more confirmed 𐎠, not to mention the illegitimate use of h, perhaps to render the syllable long. Mr Prinsep, who always adheres to the more cautious principle of reading out of the characters, not into them, takes it for *ulahidō*, which reading, however, cannot be right.

On examining more closely, we find, that two authorities are against the initial 𐎧, as many against the second 𐎶; the three last characters are identical (in the three legends); it would be therefore 𐎧𐎶𐎵𐎺𐎠. The second has the greatest similarity to an l, and the whole exhibits *Valaharō* or *Valahadō*. This is indeed very different from *Vonones*, which must have been expressed by 𐎶𐎠𐎶𐎠𐎶, if we have arranged the letters properly, and fixed the system of this alphabet

I am persuaded, that the name cannot be the same, and as a conjecture is here quite indispensable, I shall propose the following

The name of a Parthian king which will be first thought of, and which occurs three or four times, is *Volagases*. Upon coins, attributed to the former, or Arsakes xxiii. is the name thus written: BOAAΓΑΣΟΥ. What now if this name be written on the reverse of our coins? 𐎶, h, rendered by g will not excite any doubt, if an h in the middle of a word is to be expressed by Greek characters. The termination alone does not agree, and here we may suppose, that by the sharp accentuation, the penultimate 𐎶 is changed into 𐎶. This being admitted, it would

be  $\text{P}\tau\lambda\text{v}\zeta$ , *Balahazo*, as the Indian *v* is not different in pronunciation from *b*.

This result will be surprising, and I should hesitate in communicating it, unless it appeared a very natural consequence. But how to explain the matter

Of the Parthian language we know nothing, and he that likes, may think *Vonones* to be synonymous in the Parthian with *Valahazô*, or he may also obtain a really Indian word by writing only *Valahâsa*, viz. *he who contemns power* I shall choose an interpretation less ingenious, but indeed based on better historical authority

Volagases I. was the son of Vonones II The father reigned a few months, his son, known by the wars he engaged in with Rome, is supposed to have reigned between 50 and 91 A D

Another Volagases is not spoken of in Parthian history as succeeding a Vonones Have we not consequently both names upon our coins?

This conjecture appears to me so probable, that I scarcely hesitate to reject the acute one of M<sup>r</sup> Raoul Rochette,\* who states, that it was Vonones I., the vanquisher of Artabanus, and even though Mr K. O Mueller takes this explanation as undoubtedly correct, the passages of Strabo, concerning the conquests of the Parthians in Bactria, mention neither of the two Vonones

Another king, likewise not Greek, of this later period, offers another problem. Mr Prinsep states his name to be *Ipaurisos*,† and we read indeed upon the coin v Pl. xxxv No 7,  $\text{B}\alpha\varsigma\iota\lambda\epsilon\omega\varsigma \text{B}\alpha\varsigma\iota\lambda\epsilon\omega\text{N} \text{M}\epsilon\gamma\alpha\lambda\omicron\upsilon \text{I}\pi\alpha\lambda\iota\pi\iota\varsigma\omicron\upsilon$ ; the initial *I* of the name, however, is not quite distinct. R. R. I No. 21, gives nothing of the legend but  $\text{B}\alpha\varsigma\iota\lambda\epsilon\omega\text{N} \text{B}\alpha\varsigma\iota\lambda\epsilon\omega\varsigma$ , and upon the reverse three illegible characters. Owing to the accurate drawing of Mr. Prinsep, we can supersede that of Mr Masson, *As. Trans* III. Pl XI. No 44. Upon No 6 the name does not occur in Greek, the rest is distinct

Mr. Prinsep has established his reading upon the comparison

\* II p 28

† *As Trans.* V. 551



of six well preserved copies, but the comparison is made by M<sup>r</sup>. Masson, and he will excuse me in asserting, that the name of the king was not this; the native legend being preserved remarkably well, is thus upon both specimens of Mr Prinsep: פֿרִינְסֵפֿ פֿרִינְסֵפֿ פֿרִינְסֵפֿ.

*Mahárágô* shall no longer detain us With regard to *mahatakô* for *great*, I do only remark, that *mahatô* has here the additional termination *ka*, so frequent in Prâcrit,\* there it would be *mahantakô*, our king was apparently fain to compensate by the adjective the loss he had to suffer on account of the substantive, for βασιλείως βασιλέων certainly carries the impression of higher dignity than *mahárágô*, or it was perhaps the title *king of kings*, already so worn out, as to be of no more value than *mahárágô*

If we pass to the name, the penultimate letter ρ (No 21), must be, it appears, a sibilant, according to the Greek; in denoting it by s, I do not anticipate an examination, hereafter to ensue, in order to distinguish more accurately between ρ, ρ, ρ. The ρ will occur again as a sibilant. This being settled, the name is *Kalrisô*. But whatsoever alteration of the names the language of our coins may have admitted, according to its genuine laws, it could never have changed an *ipa* into k. I therefore maintain *ipa*, not to be the real commencement of the name

What was it then? On this we are informed by the coin of *Spahrrios*, connected at least by name, for it represents, As Trans. v Pl. xxxv. No 6, iv Pl. xxi No 9, (the e which is indispensable near l, is very indistinct upon the latter, and it does not occur at all upon the former), the initial letters by *kala*—(*kah*); here (for the coin of *Ipalirisos*), we require only the initial letter, which we find to be a *ka* for the Greek σπα. I maintain, therefore, that the pretended *Ipalirisos* was called *Spahrrios*.†

Many will perhaps think this alteration impossible; but I am of opinion, that it may not only be vindicated, but that it is particularly adapted to confirm, in a striking manner, all that has been previously said on the nature of the language.

\* My Grammar p 288

† Spalirishasa is Mr James Prinsep's latest reading of this name from the Bactrian legend —H T P

Now we know, that the languages of Iran do not admit the Indian compound *sv*, for which they adopt another, more agreeable to the laws of their sounds. The junction of consonants, originally substituted for *sv*, is *hv*, as also *h* is used for a simple *s*. This *hv*, hardened in Zend, becomes *kv* or *q*, which simple sound is substituted for the Indian compound *sv*. The old Persian language, less hard in sound, softens the above mentioned *hv* in such a way, as to lose the *h* in *u*, so nearly related to *v*, the junction of characters, which corresponds in the arrow-headed writing to the Zend 𐬨, properly denotes therefore *uv*.\* This alteration is foreign to the Indian Prâcrit

According to my opinion, the *k* in the name, above mentioned, represents, as the Zendic *q* does, the compound *sv*, which is included in the Greek letters  $\sigma\pi$ . *Sva* might be expressed in Greek by  $\sigma\upsilon\alpha$ . But by supposing, that *v* was more hardly pronounced, (as for example the *çv* of Sanscrit indeed becomes *çp* in Zend), we shall not find the orthography  $\sigma\pi$  for *sv* very strange. And I shall not insist even upon maintaining, that those kings were called *Svalyrios* and *Svalirisos*, but I use only *sv* to explain, how *k* (equivalent to) 𐬨 may represent *sp*; This *k* is the third Iranian transformation of *hv*, in the process of which *h* becomes hard, as in Zend, but entirely drops the sound *v*, consequently *sv* in Sanscrit, *hv*, or *q* in Zend, *uv* in ancient Persian, *k* in the language of the coins, not yet geographically defined, (as to the countries in which it prevailed.)

But why then a double kind of pronunciation upon the same coin? If the name of the king was *Kalirisos* in the native language, why was it not the same in Greek? and how could it be written *Spalirisus* in Greek, if it in fact did not sound thus in the language of the country? A third view is still possible, which appears to settle the difficulty. The king, not being a native, was probably called *Spalirisus* or *Sualirisos* in his own language, but not in the language of the country, whose inhabitants were under his sway. They changed the name into *Kalirisos*, according to the system of their sounds, while the coin-stampers, knowing the Greek language, had no reason to call him otherwise than he did himself.

\* The old Persian arrow-headed inscriptions, p. 107



of the foregoing king, the mark of the vowel <sup>e</sup> is so often omitted, that we need not scruple at supplying <sup>e</sup>, as a vestige of it is almost extant upon one coin. But if the first two syllables are *kah*, the third must be <sup>e</sup>. For this the only distinct specimen has a character which we may take for *r*, to the head of whose angle a small circle is annexed. But then follows a sign which we may read as *t*, *d*, or *r*, and hence we are not allowed to take the preceding sign as *r*. The same  $\phi$ , however, denotes a Greek *v* upon the latest coins of this class. The most probable conjecture therefore would be to supply *e* with regard to the fourth character, and so far it would be read, *kalyri*. But now, according to the precedent of the previous names, there must follow  $\Psi$ , *jô*, viz. *Kalyrijô*, instead of which we meet with a character which is merely to be read as an *m*. The fact, however, that  $\Psi$  follows  $\cup$ , is of main importance, as this being the case, the word is complete.

According to the specimens lying before me, this  $\Psi$  is not certain, and the entire reading is therefore left problematical.

*Mô* does by no means compensate for the expected *jô*, on the other hand the Greek writing in no sort authorises us to read *OY* instead of *MOY*. I cannot unravel this difficulty. Mr. Prinsep presumed, the word which I take for the name, to be the translation of *brother*, and supposed, that the word *king* was at the end of the legend. Against this supposition I have to raise the decisive objection, that the name cannot be expressed by the first word, and that, on the contrary, we can point it out on the most plausible conjecture in the third word. This being the case, the construction differs from the Greek,\* and the *brother of the king*, or what corresponds to this word, occupies the first place; the legend, as far as I have observed, never commences upon these coins from below, in consequence, we have not to look for another word, preceding the first. Nevertheless it is possible, that the third word was followed by a title for *Spalyrios*, though there is left no room for a legend below, if the coins are exactly represented.

The first word seems to have been so well and congruously

\* Mr James Prinsep reads the Bactrian legend of the coins of *Undopherras*  $\Psi \Gamma \iota \chi \Psi \Gamma \epsilon \lambda \phi$  *Farahetasa Nandatasa*, which seems a preferable reading to this of Mr Lassen — H T P

preserved, as not to admit any alteration of the letters. We dare only speculate, as to whether it have six or seven characters, and as room is left for the first (?) according to my previous remark, we may presume, that Mr. Masson was mistaken with reference to this letter. The word is therefore  $\text{P} \text{f} \text{H} \text{I} \text{I} \text{I} \text{I} \text{I}$ . This, however, is a complete mystery to me; neither do I know a word, which denotes *brother* or relation of any degree, bearing the least similarity to this, nor can I derive a proper signification from those syllables, though the end (*paró ? páddó ?*) exhibits a common Indian word. I must therefore leave this word to an inquirer who is more fortunate in guessing, or more acute in discerning.

Another barbarian king was named *Ynadpherres\** or *Yndopherres†* (Undopherres) and styled himself βασιλέως σωτήρος or βασιλεύς σωτήρ; for the Greek legend gradually exhibits the nominative, which the native language used from the beginning, As. Trans. Vol. iv. Pl. xxiv. No. 5—8. The legends, which are much spoiled, supply each other's deficiencies as follow; I remark, that the name is to be read from within the inside, and not in the manner in which we usually read coins, by keeping the image on them in its natural position; this will be easily evident, if the letters are looked at in the usual way—

|     |   |       |                                                                           |                                                         |                                                                  |
|-----|---|-------|---------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------|
| No. | 5 | gives | $\text{P} \text{f} \text{H} \text{I} \text{I} \text{I} \text{I} \text{I}$ | $\text{P} \text{I} \text{I} \text{I} \text{I} \text{I}$ | ---                                                              |
| „   | 6 | „     | ---                                                                       | $\text{P} \text{I} \text{I} \text{I} \text{I} \text{I}$ | $\text{P}$                                                       |
| „   | 7 | „     | $\text{P} \text{f}$                                                       | ---                                                     | $\text{I} \text{I} \text{I} \text{I} \text{I} \text{I} \text{I}$ |
| „   | 8 | „     | $\text{P} \text{f} \text{H} \text{I} \text{I} \text{I} \text{I} \text{I}$ |                                                         |                                                                  |

\* Mr James Prinsep explains this, by discovering the word *Pütasa* after *Balahara* or *Svalahana*, and the difficulty does appear to be removed by this reading, which is quite reconcilable with the idiom of the language—H T P

† There is only one letter preceding N, namely Y. Mr Mionnet reads likewise  $\text{Y} \text{N} \text{A} \text{D} \text{F} \text{E} \text{P} \text{P} \text{O} \text{Y}$ , and adds a Sic? Description de médailles antiques supplément, Tome viii p 506. I only got this work, while printing my book. I am sorry to add, that the reading of the native legends is not only not advanced by the representations there exhibited, but the legends, which we may read without difficulty in the representations of them, given by Messrs Raoul-Rochette and Prinsep, are perverted in an indistinct web of confused strokes. The false classification might be passed over, as it would not cause great impediment to inquiry, but I have taken sufficient pains with this work, to dare to assert, that to try to decipher anything with certainty from those copies would be labour in vain.

I have already before discussed the orthography of *dhādhārō*, here it differs only in that it is placed before the word *king*.

By comparing the four specimens, we observe, that the name consists only of five native characters, and also that it ends in *ô*. The first letter *ϕ* of the word cannot be but a vowel in its initial form, and according to the course of the language, in other instances, we should have to adopt an *e* for *v*. As, however, the letter *ɳ* in the name Eukratides was fixed for this, the sense of both letters becomes doubtful; for *ϕ* being *e*, *ɳ* would be *u*, and *vice versâ* I would rather adopt *y* for *ϕ*, keeping the signification *e* for *ɳ*; for we found above *ϕ* must be a vowel, which we know cannot be *e*, as *e* is never written in the line, while in the Greek the equivalent was *v*. The symbol *ϕ* often occurs in the legends of Manikyâla, and is certainly genuine. No. 22.

Between *y* and *ô* there are merely three letters for the three consonants *d-ph-r*, commencing the syllables, which we ought to admit, if the name was *Yndopherres*, in this case the *n*, preceding *d*, is dropped according to the rule. Also the second symbol is a real *d* upon one specimen; upon the second is a character, which appears indeed to be corrupt, but a corruption rather of *n* than *d*. If *Ynadpherres* be considered as the name, though the language of the coins would absorb *d* into *ph*, yet it would not express by any legible mark the *d*, so absorbed. We are here also left in the dark, but as *d* is much more certain than *n*, I shall at once decide in favour of *d*. Therefore *yda* stands for the first half. Then follows *ʾ*, *ε* being expressed by *e*, we must consider it as denoting *ph*, but we above found *p* for *ϕ* in *Philo*xenos, and shall do the same in *Kadphises*. The tolerably distinct coin of *Kadphises* has, however, (As *Trans.* Vol. iv. Pl. xxxviii. No. 3, as with *Tod.* Pl. xii. No. 10,) the form *𐰆* for *pi*; here the little cross line is perhaps meant to give the force to *p* as *f*. Our *ʾ* is entirely different from it; what might be taken for the mark of a vowel, is no *e*, and could at the most be *u*, this will not advance us a step further. On the other hand *ʾ* has a great similarity with the initial letter of Eukratides, and as *ê* is probably written in the line, according to the analogy of *ô*, we might read here







was to be read without any flexion, as other coins exhibit *Καδαφες*. The less reason is there then to connect *mo*, which has no flexion, with *Kadphises*. It is evident, that much is here left to be explained, but chiefly the word which has been proved superfluous, whether it be in the middle or on the end. We shall likewise mention the two symbols  $\text{†}^{\text{m}}$  and *f*, No. 23 and 24, as wanting confirmation.

The most ancient coins, on which appear the characters hitherto discussed, come down to about the year 180—160. B. C. The kings *Yndopherres* and *Kadphises* probably reigned in the first century A. C. A variety of the same characters, more like italic characters, but not essentially differing, is met with among relics in *Manikyâla*, where are discovered likewise coins of the *Sassanides*; traces of these characters are even to be observed upon the coins of the *Sassanides* themselves; we can therefore assign to this alphabet a period from the year 160 B. C. at least to the year 226. A. C., a period therefore of four hundred years. From *Menandros* and *Eukratides* to *Yndopherres* this difference alone is remarkable, that the characters of the native alphabet continue to be well formed and regular, while the Greek deteriorate more and more to a barbarian level. The italic letters out of the *topes* probably exhibit, rather the running hand in daily use, while the characters upon the coins represent the monumental form.

This remark may serve to introduce a variety of the writing upon the coins, of a peculiar spiral form, which we have no reason for assigning to a later period than to that of *Kadphises*, and which would therefore appear to be a provincial deviation from it.

## § 6

### *Variety of the characters of coins upon some coins of Hermaos.*

I here bring together another class of coins, not yet very numerous, which, like the preceding, present upon the one side Greek, upon the other side native legends in a peculiar form of the alphabet, to which, however, Mr. Prinsep has already drawn our attention. *As. Trans.* iv. p. 347. Besides the Greek has become much more rough, and we do not know, if we meet with barbarian words, or with Greek ones in the dis-

figuration, effected by barbarian ignorance ; the native characters appear at the first glance quite foreign to us.

We will first compare two coins, *As. Trans.* Vol. v. Pl. xxxv. No. 12, and Vol. iv. Pl. xxiv. No. 11. The one has the Greek legend, ΚΑΔΦΙΖΟ ΧΟΡΓ --- ΚΟΖΟΥΛΟ, and supplies the other, where we find, ΚΑΔΦΙCΕC ----- ΝΟ, as it seems for, ΚΑΔΦΙΣΕΣ ΚΟΖΟΥΛΟΧΟΡΑΝΟ ; for here is O generally a square, and C for Σ.

The native legend has

𑀓𑀲𑀭𑀮 - - - - 𑀓𑀲𑀭𑀮𑀲𑀮

𑀓𑀲𑀭𑀮𑀮 - - - - 𑀓𑀲𑀭𑀮𑀮

iv. Pl. xxiv. No. 13 is not certain.

We are astonished at recognising in the first two signs after the cross, which recurs often upon these coins, and scarcely has the value of a letter, the last letters in the foregoing Kadphises legend, represented according to Mr. Prinsep. We may read them *nara (man)* The letters, subsequent to this, are evidently in the common character of the coins 𑀓𑀲𑀮, save, that here a round tail is substituted for the small cross line below, as the characters are generally altered from an angular to a rounder form. We find consequently *Kagala*, or if we read according to the Greek, the inherent *a* by *o*, as it is now also read in Bengalee, *Kogolo*, we have therefore here the un-Grecian word, which already occurred in the Greek writing.

If we turn to the last word, the initial letter of it is y, the two last syllables are *vama* or *vomo* Though we might take the second letter for 𑀲, according to one coin, yet the others, belonging to this class, have always a character similar to 𑀲, and the word consequently is *yhovomo*, which obviously is the word 𑀓𑀲𑀮𑀮 upon the coins of Kadphises ; 𑀲 therefore is u, and we accordingly must infer, that the name in the foregoing legends had existed in the unoccupied space (of the legend).

Let us place these coins in comparison with all those, the relics of whose Greek legends are as follows : *As. Trans.* Vol. iv. Pl. xxiv. No. 9, 10, 12, v. Pl. xxxv. No. 10, - - ΔΕΩΣ ΣΤΗΡΟΣΣΥΛΑ - ΒΑΣΙΛΕ - - - ΕΡΜ - ΒΑΣΙΛΕΩΣ - - - Ε - Υ, - and ΒΑΣΙΛΕΩΣ ΣΤΗΡΟΣΣΥ ΕΡΜΑΙΟΥ.

We have here an entirely foreign word ΣΤΗΡΟΣ. If this,



conjecture, entirely ungrounded, as we cannot at all explain the following; not even the name of Hermaios is to be discovered, and we should probably find extant the name of his Scythian conqueror, together with what corresponds to the strange, ΣΥ.

Notwithstanding this obscurity, we may, however, derive some isolated facts from these coins, first, that the language is here no longer Indian. Thus *Uhavima* and *Kagala* do not admit of a natural and appropriate interpretation as Indian words. Both of them perhaps belonged to the Scythian language, and it appears cannot be explained, but with reference to the context. KOPANO agrees with the Indian dialect upon the Kanerkes-coins, which have PAO in place of the former Râjô; we cannot therefore allow of Κοίρανος. Nor can it denote *king* or *prince*, used as it is in immediate connection with PAO, king. Therefore upon the Kadphises-coins, where XOPANO appears in juxta-position with KOZOYΛO, the title of *king*, must be looked for, being probably KOZOYΛO, *king*. As these Hermaios-coins have the word βασιλέως, and give στήρως as a Greek word, viz. for σωτήρως, we must expect to meet with an equivalent for *deliverer* upon them; the plausible inference suggests itself, that *Uhavima* upon the reverse may be the Scythian word for σωτήρ.

To this interpretation it may be objected, that *Uhavima*, being the same with Οσημο in the great Kadphises legends, is observed to follow σωτήρ, and that consequently it cannot be the same term, but rather some native epithet of the Kadphises.

To this division belongs a third variety of Kadphises-coins, upon which ΖΑΘΟΥ is substituted for KOZOYΛO, this also is a term for *king*, probably not of Scythian origin; for it occurs As. Trans Vol v. Plate xxxv p 553. XOPANOY ΖΑΘΟΥ ΚΑΔΑΦΕΣ.

I shall not undertake reading the native legend from the edited specimen, especially as Mr Prinsep has promised to put together some other coins of this class.

KOPANOY and ΖΑΘΟΥ are declined as Greek words, unless ΟΥ be not taken for a varied orthography of Ο: the barbarian name *Kadaphes*, on the other hand, is not declined

*Zaθov* calls to mind as well the Sanscrit *Kshattr* (man of the military caste) as *Khshathra*, the Zend word for *king*; the *r* in this case would have been absorbed on account of the softer dialect, while *z* was used for *khsh* (X) or rather for a softer pronunciation, perhaps *sh* as in *Pilushino* for Philoxenos. This interpretation being ascertained, we make the attempt at explaining also in the same dialects the word KOPANO, or XOPANO. *Kirana* (ray *quasi*, radiant) finally adopted by Mr. Prinsep, is not at all satisfactory, any more than *Karana* (to do) but *Karana* also denotes man of impure caste, son of an impure Kshatrija couple, or according to the opinion of others, son of a Vaishcha by a Soodra woman, whose occupation is the profession of a writer. By this interpretation we should have got two titles from Indian castes. But I am prevented from acceding to it by the fact, that XOPANO occurs with ZAΘOY, and that the combination of the different titles of this class of coins leads to *σωτήρ*, as representing the word KOPANO; for the title *deliverer* is adhered to with such predilection by those Scythians, that we may ordinarily expect this meaning, and as ZAΘOY for *king* probably refers to a dialect, nearer related to Zend, I would rather look for an interpretation to that language. Here, however, it appears, it is not to be discovered; for though *qarena* is a word in Zend, the signification (*brilliant*) is not a proper one. The following, however, also speaks in favour of Zend. By the title KOPANO a tie is formed between the Kanerkes-coins, and those of the family of Kadphises, for both of them are thus styled. But then the other words upon the Kanerkes-coins refer to a dialect, which indeed also contains reference to India, but at the same time points at certain elements, more congenial to Iran.

While this class of coins, partly by the name *Hermaios*, partly by the title *σωτήρ*, and by the combination of Greek and native legends, is linked together with the expiration of Greek dominion, it is also connected by the word KOPANO with the class of Kanerki coins of partly Scythian origin, the words of which, though not of the Greek language, are always written in Greek characters. The terms *Zaθov* and *Koζουλο*

as well as the form of characters, somewhat altered, are peculiar to it, whilst other coins with the name *Kadphises* present the characters, previously used. The real *Kadphises* coins have all symbols of worship of Siva, and the word *oohmo*, *Uhavima*, the *Karano-Kadaphes*, a Hercules.

To comprehend all the palæographic and philological facts, referring to our investigation, we must, before entering upon the attempt at applying these coins to history, at least touch on some other relics of this writing

### § 7.

#### *The legends in the Topes.*

In the digging of the *Topes*, (*stoopas*), which are so frequently discovered throughout the whole region, governed by the Indo-Scythian kings, and which were most probably destined for their ashes, some inscriptions are found in the same characters we have hitherto discussed, in a more running hand, however, and difficult to be read with accuracy. They are published by Mr. Prinsep, and I may refer to his accounts of them \* These inscriptions being important in more than one respect to our investigations, we should have made the attempt at their interpretation, if we could have done it, without departing too much from the subject, peculiar to this work

But this departure would have been necessary, for the writing is more indistinct than that upon the coins, especially so the characters of the inscription, most ample and apparently most important. Though engaging therefore in tedious grammatical discussions, yet many things must have been left partly without any explanation, and partly under a mere doubtful interpretation, and from the decyphering, but partially successful, no profitable conclusion would have resulted, as respects the historical arrangement of the Indo-Scythian kings. Lastly, it would also have been necessary to have entered upon a consideration of the end, for which these remarkable architectural monuments themselves were constructed, and to have examined the views, which a celebrated German scholar has pronounced concerning them. The *topes*

\* As *Trans* III. Pl. XXI. and Pl XXXIII. It must be attributed to the inexperience of these characters at that time, that the inscriptions are reversed

are much better adapted to a separate treatise, which may be published in time.

Here we shall merely call in question the view under which these monuments are deemed Buddhist. Buddhistic coins, exhibiting on the obverse the old Indian characters which occur on the columns of Asoka, and on the reverse those characters we are here illustrating, have been indeed discovered in India, but never in the topes. Hence appears it very surprising, that Buddhist kings should have had buried with them, various coins of the Romans, of the Sassanides, of the worshippers of Mithra, and even such as allude to the worship of Shiva and Vishnool, excluding entirely (then own or) Buddhist coins.

We shall take from these inscriptions only what is confirmed beyond doubt. They first prove, that the native characters, adopted upon the coins by the Græco-Indian kings, out of regard to their subjects, were not only retained under the government of the first Indo-Scythian, but also continued to the period of the Sassanides; for in the topes Sassanian coins, furnished with Pehlvi, and Deva Nagaree legends, are discovered among the coins of Kadphises, and Kanerki. The characters of our coins therefore were still in use under the Sassanides, even after the time when the Kanerkes dynasty had abolished the use of the characters upon the coins in their empire.

The inscriptions, moreover, bear witness to the writing being used for other purposes than for inscriptions on coins, probably, however, by kings only of foreign descent, and who reigned on the borders of India. On this hereafter.

Lastly, with regard to the language; as the termination ô frequently recurs, and the word *Mahârdjô*\* was discovered by Mr. Prinsep in the larger inscription of Manikyâla, evidence is afforded, that we fall in here also with the Indian language; the inscription at Jellalabad contains purely Indian words in Prâcrit.

Upon monuments of a later period than that of the Sassanides, no traces of the characters upon our coins have yet appeared

\* As Trans III pl XXXIII second line, IV p 336

§ 8.

*Corns of Agathokles and Pantaleon.*

We may now turn to another class of coins, those namely of the kings, above mentioned. The coins of both of them have genuine Greek characters, and those of Agathokles must be numbered with the most beautiful coins, which have been preserved, and belong to the most flourishing period of Greek art in Bactria, and the countries adjacent. Both kings hold to the simple title βασιλέως, but have besides upon the reverse of some coins, legends in the most ancient shape of Indian characters, of the very same shape which is discovered in Prâcrit upon the laths, thus styled, or columns with Buddhistic inscriptions in Prâcrit.

The merit of having decyphered these most ancient Indian characters, is also due to Mr. Prinsep, and I have here only to give an account of the manner he has applied them to these coins.\*

The Agathokles coins (R R. I No 1, As Trans. III. Pl. IX. No. 17 v. Pl xxxv No 9) present the following signs:

ॠ ॠ ॠ ॠ ॠ The penultimate alone is indistinct, Mr. Prinsep presumes it to be ॠ, therefore *Agathuklayég*, which he takes for the Greek genitive 'Αγαθοκλεους; I should rather prefer ॠ, or *jog*. Still it appears strange to meet here with a Greek rather than a native form for the Greek That the Greek ॠ should be expressed by ॠ, or *j* may be explained by suggesting, that the final ॠ was received as a media (sound) like the z in Zend, to which *j* would be the most appropriate Indian letter These coins had another word over the female Bacchanal, of which no undisputed characters have been preserved, it is perhaps, as Mr. Prinsep supposes, a fragment of *rāja*.

In the name we observe also a mode of representing vowels purely Indian, viz *a*, not expressed by a sign, and *u*, annexed below to the consonant, as also the ligature *ke*, which is completely Indian.

Of Pantaleon have only been discovered coins with legends, likewise in the same Sanscrit characters, As. Trans. vol v. Pl. xxxv. No. 8, III. Pl. ix. No. 18, excepting the first letter, the name

\* As Trans vi p 465



is preserved: 𑀧𑀭𑀢𑀺𑀓 Pantalavanta; the termination is wanting, and what Mr. Prinsep has supplied for it, tâ, appears to me unsatisfactory. Here, as with Agathokles, the hiatus in *sov* and *eo* is amended by the insertions of a semivowel, in the latter *j*, and here *v*, as above, in the names *Dyamidô*, *Lusijô*. Besides, the use of the Anusvâra must be noticed, as representative of nasal sound. Upon the Pantaleon-coins, moreover, are only illegible fragments of the title; but two of these symbols lead to *râja*, preceded by something else, which perhaps formed originally *mahârâjô*, “the supreme king.” To the historical illustration of these coins, the only ones upon which Greek and purely Indian characters are put together, we shall afterwards return.

### § 9

#### *The Kanerkes Coins*

Lastly, come we to a very numerous class of Indo-Scythian coins, having only Greek characters, which seldom represent Greek words, but ordinarily give in Greek letters, either un-Grecian regal titles, or names of gods. They are of very different types; on the obverse, either a standing male figure in the dress of a Tartar, or a bust only; or else one mounted on an elephant; or, lastly, a figure, resting on a couch, with the legs crossed one over the other, after the fashion of the East, the head surrounded by a glory. The legend sometimes ΒΑΣΙΛΕΥΣ, sometimes ΒΑΣΙΛΕΥΣ ΒΑΣΙΛΕΩΝΚΑΝΕΡΚΟΥ, or ΡΑΟ ΝΑΝΟ ΡΑΟ ΚΑΝΗΡΚΙ ΚΟΡΑΝΟ or ΡΑΟ-ΚΑΝΗΡΚΙ, upon those with the bust ΡΑΟΝΑΝΟ ΡΑΟ ΟΗΡΚΙ (ΟΟΗΡΚΙ or ΧΙ) ΚΟΡΑΝΟ; upon the others the same titles, with an illegible name. The reverses have various figures of gods, together with their names in Greek characters, but seldom in the Greek language, but commonly in a native one.

This result, which I have taken from Mr. Prinsep’s laborious investigations, may suffice for the present purpose; I also refer to him for the fact, (*As. Trans.* iv. p. 630) that the coins never present legends in native characters.

I call the king *Kanerke*, because he so styles himself, when he assumes native titles. The form *Κανηρκου* appears to have ari-

sen from the mere misunderstanding of the Scythian die-founders. Observing upon the former coins ordinarily the Greek genitive in *ου*, on the reverse in the native language the nominative in *δ*, which did not sound very differently, they overlooked the different application. *Κανησκου* therefore appeared to them the proper form, to be placed by the Greek titles, even when the use of the nominative was then adopted for the Greek legend. Thus is *Κανηρκου* put by *βασιλεὺς*, though *Kanerko* could be only properly used, when accompanied by *Mahārdjo*.

I have already previously professed my ignorance concerning KOPANO; it is singular, that *σωτήρ*, according to our conjecture, corresponding to that word, never occurs, to my knowledge, with the word *βασιλεὺς* upon these coins.

*Rao Nano Rao* is certainly properly explained by Mr. Prinsep to be the same with *βασιλεὺς βασιλέων*; I add the following remarks on the forms. *Rao* (viz *raó*) points to a dialectic difference, a step more distant from the original form, than is the form *rayó* of the other coins, for in the first place the consonant *j* is dropped, a proceeding indeed often resorted to in the learned Prâcrit; but whenever *râa* and *râjá* are found together in the ordinary spoken language, the difference in form, refers to a difference in dialect. To the historic grammarian *rad* is a later form than *râja*, however, it need have therefore arisen at a later period; for one dialect may have anticipated the rest in the reduction of the old forms; we may, or may not, therefore, refer dialectically *rao* to another province. Again, the declination of *rao* is not as the simple word *râjan* would require it should be, according to Sanscrit rule, but, on the other hand, the compound word *maharajah* is most properly brought under the declination in *a*; but as we do not know any instance of the simple word *râjan*, the parallel has no application. ●

*Rao Nano* can merely be the genitive plural. In Prâcrit it would be *rannam*, or after the declination in *a* *râ(j)a nam*. Instead of this, *Nano* seems to be the termination upon the coins in question, and this termination is not joined to *râa*, as to the root of the word, but to the nominative *rao*, and the *m* of the termination is changed into *no*. If I take a right view of the form *raonano*, it belongs to the period of transition, when from the

first degree of the decomposition of grammatical structure of the Sanscrit, evidence of which is exhibited to us in Prâcrit, the language was about to retrograde another step; thus, not distinctly comprehending the sense of the old form, the language then in use could no longer distinguish the peculiar form of the root from that of the termination.

The name *Kanerkî* has been compared with *Kamishka*, which occurs in the chronicle of Caschmir, and in the traditions of the Buddhists. I would not scruple at the *r*, as supplied by *sh*, and if the comparison of them was well founded, I would even proceed a step further, and find in *Onpki* the same *Hushka*, who is mentioned with *Kamishka*. On the supposition, that *Onpki* might stand for *Huirki*, and *sh* substituted for *r*, we could easily fancy *Hushka* to be altered into *Hushka*. But besides the difficulties in chronology, which I have not to enter upon at present, another reason from the coins themselves is opposed to our recognizing *Hushka* and *Kamishka* in *Onpki* and *Kanpki*. Both of them are described as Buddhist, upon the coins of these latter, however, a worship, entirely deviating from that of the Buddhists, is distinctly obvious.

For these coins present on their reverse figures of gods, as to which, on a reference to the various religious systems, prevailing for the first centuries of our era in central Asia, we fortunately can be but rarely in doubt. The names occur with them, and in part quite legible. I may here refer to the explanation, most successfully given by K. O. Mueller,\* on the system of gods, represented upon the *Kanerkî*-coins. According to him, it is a system of typified gods, originating in the pure worship of Zoroaster's doctrine of light, which readily adopted the elements of the worship of Nature, prevailing in Asia Minor at that period, while it at the same time communicated to all the objects of worship, so adopted, the general stamp of *gods of light*.

\* Goett. Gel. Anz 1838, 237, p. 233

(To be continued.)

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*Note on the Lepchas of Sikkim. By A CAMPBELL, Esq Superintendent of Dorjeling.*

When I had the honor some months ago of forwarding a few Notes on the Mech tribe,\* I ventured to announce my expectation of being able to furnish some particulars of other tribes inhabiting the neighbouring countries of eastern Nipal, Sikkim, and Bootan To this end, I had collected and recorded some useful memoranda regarding the Lepchas, Bhotiahs, Limboos, Murmis, Gurungs, and Hains, all mountaineers, which by an unfortunate accident were destroyed by fire, nevertheless, as the establishment of this Sanatorium for our countrymen affords them opportunities of communicating with classes of men which have hitherto been denied to all except the few who under very restrictive circumstances have sojourned in Nipal, I am induced to forward some particulars of the Lepchas, with an alphabet and very meagre vocabulary of their language, in the hope that they may be of some assistance to persons visiting this place, who may have leisure and a disposition to acquire the means of colloquial and written intercourse in their own language, with a most interesting people, and I believe the undoubted aborigines of the mountain forests surrounding Dorjeling.

Although the Lepchas have a written language, it has not been ascertained that they now have, or ever did possess any recorded history of themselves, or chronicles of any important events in which they have taken part The "Lepchas," so called by us, and indeed by themselves in conversation with strangers, are divided into two races, viz. "Rong" and "Khámbá" Rong in colloquial intercourse among them is a generic term, and equivalent to "Lepcha" with us But a man who announces himself a Lepcha to an European, Nipalese, or Hindoostani, may, on being questioned, turn out to be a Khámbá. The real Lepcha, or Rong proper, has no tradition whatever, so far as I can learn, connected with the advent of his tribe into this part of the world. Here he has always been, to the best of his knowledge and belief, and this is corroborated by all his neighbours. The habitant of the Lepchas occupies an extreme

\* Vide As Soc. Journ No 92

extent of about 120 miles from north-west to south-east, along the southern face of the Himalaya, to the west, the Tambar branch of the Koori bounds it, but on the east its limits are undefined in the mountains of Bootan. Thus they are found among the subjects of eastern Nipal, throughout the whole of Sikkim, and extending an unknown distance into Bootan. I believe however that they are found in very small numbers indeed further east than fifty miles beyond the Teestah, although a few of them are said to be located as far east as Punnuka, and Tassgong.\*

The Khámbá although now the same in all essentials of language, customs, and habits, as the Rong, is professedly, and undoubtedly, an emigrant from beyond the Himalaya. They state themselves to have come from a province of China, called Khám, which is described as lying to the east and north of Lhassa, about thirty days' journey. This province has not been very long annexed to the Chinese empire, and if the accounts I have heard from members of the Nipalese Missions to Pekin are to be relied on, its rulers and inhabitants are even now far from being well governed and peaceable subjects of the celestial dynasty. They are represented as a herd of lawless thieves and robbers, through whose country it is scarce safe to travel, even when under the protection of an escort from the Court of Pekin.

The Khámbás reckon seven generations since their arrival on this side the snows, which may be computed at 200 years. They were headed by the first ancestor of the present Sikkim Raja, who is himself a Khámbá. Previous to the arrival of the Khámbás, it is said that great confusion existed among the Lepcha and Bhotia aborigines of Sikkim, in consequence of the incessant struggles for supremacy between their chiefs; they however had priests (Lamas) from Paling Goombah, beyond the snows, whose advice was often followed in temporal matters, and when it appeared to these learned leaders that it was hopeless to quiet dissensions by ordinary means, they suggested that a Raja should be sought for in some distant

\* Towns in Bootan, see Pemberton's report.

country, to whom all classes should tender allegiance. This was agreed to, and a deputation of Lamas proceeded into Thibet Pote-leang, in search of a fitting ruler for Sikkim, here they were unsuccessful, and passed on to Kham-leang,\* where, after much trouble, they discovered a boy, the son of respectable parents, whose horoscope was considered auspicious; he was offered the Sikkim crown, it was accepted, and attended by his Khámbá clansmen was brought from beyond the snows, and proclaimed Raja of Dinjong (Lepcha for the Sikkim country)

The first Raja although chosen for the office in a similar manner to that adopted in the election of fresh incarnations of deceased Lamas, did not exercise any spiritual authority over his people; the Lamas who brought him to the throne retained this in their own hands for some time, but not long after the spiritual power came into the family of the Raja, where it still continues. At present, the eldest son of the Raja is a Lama and high priest of the kingdom, a younger son being nominated heir apparent to the throne.

The Khámbás although a Trans-Himalayan tribe, and hence by us generally denominated Bhotiahs, or Thibetans, consider themselves included in that generic appellation, but the following distinctions are made by the Lepchas in talking of people who are called Bhotiahs by Europeans—the Bhotiah from beyond the snows is “Pote,” and his country “Pote-leang,” he of Sikkim “Arratt,” and his country “Dinjong,” and he of Bootan is denominated “Proh-murroh,” or man of Píoh

The Lepchas, Khámbás, and Lepchas proper, to be understood as included under this term, are Bhuddhists, following the priests of Thibet and those of their own tribe indiscriminately; the former from being generally educated at religious establishments of repute, are considered the more orthodox, the latter rarely go beyond the snows to study, when they do, they derive the full advantages of the superior consideration accorded to the Thibetans, provided they adhere to the strict rules of monachism. Marriage is permitted to the native Lepcha priest,

\* “Leang,” country or province

and he is counted as a good match for the daughters of the chiefs. The influence of the priests is considerable, but it is far short of that attained by those of Bootan over the Bhotiahs, as described by Captain Pemberton, and the majority of them are obliged, and not ashamed, to relinquish a dependence on alms for the more active employments of agriculture and trade.

Restrictions of Hindooism as to caste are not admitted by the Lepchas, although those who live under the Nipal government are obliged to conform to the Hindoo laws of that state, this however they do with a very bad grace, and rarely forego an opportunity of crossing into Sikkim, or coming to Dorjeling, to indulge their beef-eating propensities. They are gross feeders, eating all kinds of animal food, including the elephant, rhinoceros, and monkey, and all grains and vegetables known to us, with the addition of many roots and plants altogether excluded from our culinary list. Pork is their most favourite flesh, next to that, beef, goat, mutton. The yák is considered the best beef, next to that the flesh of the Sikkim cow (a fine animal) and last, the Bengalli and common cow. All birds are included in their list of eatable game, of the carrion of wild animals that of the elephant is most prized. The favourite vegetable food is rice, next to it wheat, barley, maize, millet, murwa, and a fine species of yam called "bookh," which grows all over these mountains, at elevations of from 1500 to 3000 feet. During the rains when grain is scarce they contentedly put up with ferns, bamboo roots, several sorts of fungi, and innumerable succulent plants found wild on the mountains. Fond of fermented and spirituous liquors, they are nevertheless not given to drunkenness, their common drink is a kind of beer made from the fermented infusion of Indian corn and murwa, which is weak, but agreeably acid, and very refreshing. This is drunk at all times when procurable, and when making a journey it is carried in a large bamboo chungu, and diligently applied to throughout the day. They have no distilled liquor of their own, but they greatly admire and prize all our strong waters, our port and sherry, cherry brandy, and maraschino. Tea is a favourite beverage, the black sort brought from China in large cakes being that preferred, it is prepared by boiling, after which the decoction

is churned up in a chungu with butter and salt, milk is never taken with tea

Their cooking is careless, coarse, and not cleanly. Rice is generally boiled, when travelling, in pieces of the large bamboo, at home in coarse iron pots. Vegetables are always boiled, in oil, when the latter is procurable, and spiced with capsicum and ginger, of which these hills possess very fine kinds. Salt is not a commonly used condiment, the chief source of supply until lately being Thibet, whence rock salt is brought on men's backs; the easier communication with the plains of Bengal by the new Dorjeling road admits of the importation of this article at a cheaper rate, and sea salt is rapidly taking the place of the other

The Lepcha dress is simple, handsome, and graceful. It consists of a robe of striped red and white cotton cloth crossed over the breast and shoulders, and descending to the calf of the leg, leaving the arms bare, a loose jacket of red cotton cloth is worn over the robe by those who can afford it, and both are bound round the waist by a red girdle, some strings of coloured beads round the neck, silver and coral earrings, a bamboo bow and quiver of iron-pointed arrows, and a long knife, complete the dress of the men. The knife, called *Bán* by the Lepchas, and *Chipsá* by the Bhotiahs, is constantly worn by the males of all ages and ranks, it hangs on the right side, suspended from the left shoulder, and is used for all purposes. With the *Bán* the Lepcha clears a space in the forest for his house and cultivation, it is the only tool used by him in building, with it he skins the animals who fall a prey to his snares and arrows, it is his sword in battle, his table knife, his hoe, spade, and nail parer. Without the *Bán* he is helpless to move in the jungles, with it, he is a man of all work; no wonder then that the expertness with which it is used by the boys of a few years old even, should be the astonishment of strangers.

The women are less handsomely dressed than the men; a piece of plain unbleached cotton cloth, or the cloth of the castor oil insect, rolled round to form a sort of petticoat, with a loose bedgown of the same, and a profusion of mock



coral and coloured bead necklaces, form their entire wardrobe. They are the domestic and farm drudges of the men, performing all out- and in-door work along with their husbands, and much besides. It is not unusual to meet a stout and active man bow in hand, sauntering along the road followed by his wife and sisters heavily loaded with grain or merchandise. It is the delight of a Lepcha to be idle, he abhors the labour of practising any craft, but he expects that while he is amused and unemployed, the female part of the household shall be busily engaged in the field, or in looking after the pigs and poultry.

Marriages among the Lepchas are not contracted in childhood, as among the Hindoos, nor do the men generally marry young. This arises mainly from the difficulty of procuring means of paying the parents of the bride the expected *douceur* on giving the suitor his daughter to wife, this sum varies from 40 rupees to 400, or 500, according to the rank of the parties. It is not customary to allow the bride to leave her parents' home for that of her husband until the sum agreed on has been paid in full; hence, as the consummation of the marriage is permitted while the female is still under her father's roof, it is by no means uncommon to find the husband the temporary bondsman of his father-in-law, who exacts, Jewish fashion, labour from his son, in lieu of money, until he shall have fairly won his bride.

The women are not strictly bound to chastity previous to marriage, although any injury to the matrimonial bed is punished by beating and divorcement. Children born out of wedlock belong to the mother.

The Lepchas intermarry with the Limboos and Bhotiahs, and the offspring of such unions become members of the father's tribe, without any disqualification whatever.

The Lepchas, like true Buddhists, bury their dead, although the Murmis, a Buddhist tribe and inhabiting the same country, burn their corpses first, and afterwards bury the ashes. The presence of death in a hamlet is always regarded with temporary horror, and the house he has visited is almost always forsaken by the surviving inmates; fevers and small-pox are considered alike contagious and greatly dreaded. On the appear-

ance of the latter in a village it is deserted by the young and strong whose relatives are not attacked, and nothing will induce a Lepcha from another part of the country to visit an infected village. Vaccination is already greatly prized by these people, for which fortunate circumstance we are indebted to Doctor Pearson's success in introducing it among them; its preservative blessings are eagerly sought for at Dorjeling by them, and the Bhotiahs from remote parts of Nipal and Sikkim

Goitre is known among them, but is by no means common, among 200 persons at this place now, I can find but one goitred individual, and that is a woman. Ophthalmia is I think very uncommon, and syphilis rarely met with. During fifteen months residence, I have seen one case of leprosy only in a Lepcha, and although the mountainous nature of their country renders the climate sufficiently damp and cold, rheumatism seems to be a rare disease, on the whole they are decidedly exempt from many of the ills which flesh is certain heir to in the most favoured countries of the globe. Consumption I have never met with, nor liver disease, nor dysentery, nor do they know the cholera by name even. These four scourges of Europe and India find no food to feed on among the Lepchas.

In person the Lepchas are short, averaging about five feet in height, five feet six is tall, and four feet eight is a common stature among the men. The women are short in the usual proportion. The men are bulky for their height, but rather fleshy, than sinewy. The muscular development of their limbs is greatly inferior to that of the Magars, Gurungs, Murmis, and other Purbottiahs. They are very fair of skin, and boys and girls in health have generally a ruddy tinge of complexion; this is lost however in adolescence, although the fairness continues. The features are markedly Mongolian, but there is a fulness and roundness of feature, accompanied by a cheerful expression and laughing eye, which renders the face a most pleasing one. The total absence of beard, and the fashion of parting the hair along the crown of the head, adds to a somewhat womanly expression of countenance in the men, and the loose bed-gown sort of jacket with wide sleeves which they wear, contributes still more to render it rather difficult for strangers to distinguish the sexes,

especially in middle age. The men very often look like women, and the women sometimes like men. The hair is worn long by both sexes, the younger men allowing it to hang loose over the shoulders, the elders plaiting it into a tail, which sometimes reaches to the knees. The women of station wear their hair in two, and sometimes in three tails, tying it with braid and silken cords and tassels. The Lepchas, both male and female, are dirty in person, rarely having recourse to ablution. In the cold and dry season this renders them unpleasant inmates of a close dwelling, but in the rains, when they move about and are frequently wet, they are passably clean and sweet.

The temperament of the Lepcha is eminently cheerful, and his disposition really amiable. In ordinary intercourse they are a very fascinating people, and possess an amount of intelligence and rational curiosity not to be met with among their Bhotiah, Limboo, Murmi, or Gurung neighbours, and indeed rarely if ever to be seen among people so completely secluded from foreign intercourse as they always have been. The marked contrast in these respects with the listless, uninquiring native of the plains, renders association with them a source of much pleasure to Europeans. They are wonderfully honest, theft being scarcely known among them; they rarely quarrel among themselves, and I have never seen them strike one another. "Do you ever fight?" was asked of an intelligent Lepcha, "No, never, (was the reply) why should we, all Lepchas are brothers, to fight would be unnatural." For ordinary social purposes of talking, eating, and drinking, they have great unanimity, but for any more important purposes of resistance to oppression, the pursuit of industry, or trade, their confidence in one another is at a very low pitch; they fly bad government rather than resist it, and prefer digging for yams in the jungle, and eating wretchedly innutritious vegetables, to enduring even the ordinary annoyances of working for wages. Although they have been called "a military people," I am disposed to consider them as wholly averse to arms, in the usual acceptation of the term. If it be military to carry a long knife, bow and arrows, yet to eschew the use of them against their fellow creatures, then, are they a military people, if it be not, they are

much more a hunting than a military tribe. I do not mean to insinuate that they are wanting in courage to fight, or that they might not, under English tuition and example, make good soldiers, but only to say, that deprived as they long, or always have been of any union in government, or as subjects of any one state, they have not that spirit of personal enterprise, and disregard of personal danger, which when constantly exhibited gratuitously, or for glory's sake, gives races of men the stamp of military habits

We have no record of Major Latter's opinion of the Lepchas, who aided him on behalf of Sikkim during the Nipal war, but I have heard since my arrival in this quarter that at Nagri, after the Sikkimites were expelled thence by the Goorkas in 1812 or thereabouts, they proved most troublesome enemies, by their custom of lying in wait in the neighbouring forests for months at a time, and losing no opportunity of carrying off and massacring any luckless Goorkha who happened to stray out of musket range of the stockades. They are pretty good marksmen with the arrow, but do not practise it regularly, they use it poisoned in hunting as well as in war.

The Lepchas are poor agriculturists, their labours in this art being confined to the careless growing of rice, Indian corn, murwa,\* and a few vegetables, of which the brinjal, cucumber, and capsicum are the chief. Their habits are incurably erratic, they do not form permanent villages, and rarely remain longer than three years in one place, at the expiration of which they move into a new part of the forest, sometimes near, often distant, and there go through the labour of clearing a space for a house, building a new one, and preparing the ground for a crop. The latter operations consist in cutting down the smaller trees, lopping off the branches of the large ones, which are burnt, and scratching the soil with the *Bān*, after which, on the falling of a shower of rain, the seed is thrown into the ground.

Their houses are built entirely of bamboo, raised about five feet from the ground, and thatched with the same material, but a smaller species, split up. This roofing is, I believe, pe-

\* *Sesamum orientale*

culia to this part of the country, it is an excellent one, and a roofing of it, especially when exposed to smoke, endures about five years. It has been adopted by us at Dorjeling, and is undoubtedly the most convenient and cheap roof as yet obtainable

I hope to furnish presently a few memoranda on the Limboos, and crave indulgence as to the defects of this letter, in consideration of the few opportunities which have as yet been offered me of mixing with the Lepchas, beyond a very limited space of country around Dorjeling, and on the Nipal frontier, in the immediate neighbourhood of the Mechi river.

*Vocabulary of the Lepcha Language*

|                          |                      |
|--------------------------|----------------------|
| fire, mē                 | grey, tok-took       |
| water, oōng,             | ivory, tangmoovik    |
| mud, phūt                | a boat, too          |
| wood, kōōng              | fish, nghoo          |
| iron, pinjing            | a snake, boo         |
| copper, song             | bird, pho            |
| silver, kom              | tiger, sitong        |
| gold, jere               | good, riupa          |
| house, lē                | God, rim             |
| man, murrōh              | the sun, suchum      |
| woman, aiyōō             | moon, lavo           |
| old man, puneom          | stars, sohōi         |
| young ditto, phaling     | clouds, punbrōōng    |
| ditto woman, phaling yeu | thunder, sungmut     |
| cow, long                | lightning, suleop    |
| bull, bop                | rain, so             |
| he goat, sarchiōō        | snow, sonong         |
| she ditto, sarmōt        | wind, sorum          |
| dog, kūshōō              | a river, oong kioong |
| bitch, kūshōō mot        | pool, oong-lup       |
| fowl, heel               | mountain, lole       |
| cock, abōō               | valley, biongsi      |
| hen, amot                | country, leang       |

|                             |                       |
|-----------------------------|-----------------------|
| wild dog, sitōm             | road, lom             |
| deer, siveen                | bridge, reep          |
| elephant, tengmōō           | ridge, bleoo          |
| father, ābo                 | jungle, puszok        |
| mother, amōō                | spring of water, oong |
| brother, eng                | rock, long            |
| sister, anōm                | tree, koong           |
| son, akup                   | grass, piay           |
| daughter, te yeu            | bamboo, po            |
| eldest brother, anum        | ratam, roo            |
| younger brother, eng chumbo | belly, tubok          |
| uncle (maternal) anen       | tongue, ālēē          |
| ditto (paternal) ākōō       | thigh, alūm           |
| aunt (maternal) azong       | leg, atong            |
| ditto (paternal) aneū       | foot, tonleok         |
| cousin, namkup              | heel, tuntong         |
| husband, gudosum            | arm, pok-chom         |
| wife, kusiyeu               | hand, akuli           |
| paddy, zo                   | finger, kuzseok       |
| rice, zo-yeu                | nail of ditto, punchi |
| barley, mong                | thumb, kudom          |
| wheat, krōō                 | knee, tukput          |
| flour, krōōtu               | eye-brow, mik-muong   |
| yams, bookh                 | eye-lash, mik-chiom   |
| milk, neene                 | elbow, kūrtoō         |
| butter, mor                 | fai, tongdom          |
| salt, vom                   | child, ong            |
| pepper, sukār               | horn, aroo            |
| garlic, mungoo              | hoof, ātet            |
| spirits, ārok               | hide, atoon           |
| beer, chee                  | bow, silēē            |
| tobacco, tamka (Hindi)      | arrow, chong          |
| sugar, (no word)            | sword, paetik         |
| pawn, (ditto)               | gun, sidermi          |
| bread, (ditto)              | gunpowder, jai        |
| cotton, kirup               | ball, dieu            |
| sheep wool, lenk amuel      | stockade, gree        |
| hair, achom                 | soldier, tik          |

skin, atoon  
 bone, kiang-moo  
 blood, vi  
 head, atruk  
 eye, amik  
 ear, aneor  
 nose, tungnoni  
 mouth, abong  
 chin, tugho  
 lips, adool  
 teeth, apho  
 beard, knut  
 mustaches, bongmot  
 neck, tuk tok  
 chest, kurgoo  
 back, achung  
 fruit, abum  
 flower, boor  
 leaf, lop  
 branch of tree, akong  
 root, aphea  
 warm water, oong rhum  
 cold ditto, oonguing  
 white, adom  
 black, anok  
 green, aphom  
 blue, phonplung  
 red, ayhur  
 yellow, poi-orbo  
 bad, muriuneh  
 fat, ateem  
 lean, achim  
 short, atan  
 tall, arhen  
 broad, aliok  
 narrow, achim  
 long, tukphune  
 strong, chet

wai, dioolung  
 plunder, anzom  
 hunger, kridok  
 thirst, kridok oong  
 sleep, mitup  
 oil, nim  
 mustard, kundong  
 flesh, mun  
 hard, ahit  
 soft, achok  
 wet, shelnoh  
 dry, sonpa  
 heavy, atcem  
 light, akioong  
 cheap, chepai  
 dear, koopai  
 light, sasong  
 dark, sonup  
 calm, sugmut mudinik  
 wind, sugmut  
 raw, azsroe  
 boiled, amen  
 roasted,  
 deaf, muteune  
 dumb, leenmuench  
 lame, rhuth  
 blind, mik misheur  
 sick, dok  
 before, han  
 small, slender, atim  
 sweet, ampa  
 sour, cheorpa  
 bitter, kaipa  
 behind, alon  
 right, fukzer  
 left, tukbliong  
 above, atong  
 below, ameen

weak, chet munea neh  
large, atecm

quick, drom drom  
slow, taioh

*Cardinal Numbers*

1 kat  
2 neath  
3 sum  
4 phulut  
5 phungali  
6 trok  
7 kucheok  
8 kũ kũ  
9 kuteu  
10 kutu  
11 kutup  
12 neatup  
13 sumtup  
14 phulectup  
15 phoongotup  
16 troktup  
17 kucheoktop  
18 ku-kutũp  
19 kutentup  
20 khaka  
21 khakaskat  
22 kakasneath  
23 kakassum  
24 kakasphulut  
25 kakasphungah  
26 kakastrok  
27 kakas kucheok  
28 kakas ku ku  
29 kakas kutesh  
30 kakas kuttee  
31 kakas kuttee katup  
32 kakas kuttunea tup  
33 kakas kuttee sum tup  
34 kakas kuttee phuleetup

35 kakas kuttee phongotup  
36 kakas kuttee trok top  
37 kakas kuttee kucheop tuk  
38 kakas kuttee ku ku tup  
39 kakas kuttee kuttentup  
40 kaneath  
41 kaneath sa kat  
42 kaneath sa neath  
43 kaneath sa sum  
44 kaneath sa phulut  
45 kaneath sa phongo  
46 kaneath sa trok  
47 kaneath sa kucheok  
48 kaneath sa ku ku  
49 kaneath sa kuteu  
50 kaneath sa kuttee  
51 kaneath sa kuttee ku tup  
52 kaneath sa kuttee neatup  
53 kaneath sa kuttee sum tup  
54 kaneath sa kuttee phuleetup  
55 kaneath sa kuttee phongo tup  
56 kaneath sa kuttee trok top  
57 kaneath sa kuttee kucheoktop  
58 kaneath sa kuttee ku ku tup  
59 kaneath sa kuttee kutuc tup  
60 kasum  
61 kasum sa kat  
62 kasum sa neat  
63 kasum sa sum  
64 kasum sa phulut  
65 kasum sa phungoh  
66 kasum sa trok  
67 kasum sa kucheok  
68 kasum sa ku ku



|                       |                        |
|-----------------------|------------------------|
| 69 kasum sa katui     | 75 kasum sa phongotup  |
| 70 kasum sa kuttee    | 76 kasum sa tiok tup   |
| 71 kasum sa katup     | 77 kasum sa kucheoktup |
| 72 kasum sa neatup    | 78 kasum sa ku kutup   |
| 73 kasum sa sumtup    | 79 kasum sa kuteutup   |
| 74 kasum sa phuleetup | 80 kaphuleet           |

### *Lepcha Alphabet*

#### *Vowels*

The first is pronounced more like o than the English ă. The second is the Scotch ă as in ăwă. The third is sounded as written, with the accent on the final ô. The fourth is the long ē, as initial of eclipse, or ee in peer. The fifth is the English o, as in obey. The sixth is pronounced as the English word awe. The seventh represents u, but its pronunciation is not so labial, I cannot give the exact sound; it is formed by a slightly suppressed expedition. The eighth is the long ū, as oo in pool. The ninth is sounded as one word, yea.

úh    ă    yeô    ē    o    ăwē    eo    ôô    yeh

#### *Consonants.*

|      |      |       |      |      |       |
|------|------|-------|------|------|-------|
| kúh  | kă   | keuh  | keo  | keeo |       |
| guh  | gă   | geuh  | geo  | geeo |       |
| buh  | bă   | beuh  | beo  | beeo |       |
| muh  | mă   | meuh  | meo  | meeo |       |
| puh  | pă   | peuh  | peo  | peco |       |
| fuh  | fă   | feuh  | feo  | feeo |       |
| hu   | hă   | heuh  | heo  | heeo |       |
| ruh  | ră   | reo,  | khuh | khă  | kheo  |
| tuh  | tă   | teo,  | thu  | thă  | theo  |
| duh  | dă   | deo,  | luh  | lă   | leo   |
| kluh | klă  | kleo, | gluh | glă  | gleo  |
| pluh | plă  | pleo, | phlu | phlă | phleo |
| bluh | blă  | bleo, | vo   | vă   | veo   |
| mluh | mlă  | mleo, | hluh | hlă  | hleo  |
| phuh | phă  | pheo, | nguh | nga, | chuh  |
| chă. | nuch | nyă,  | nuh  | nă,  | chzuh |

|       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|
| chzā, | ú     | ā,    | jhuḥ  | jhā,  | yuh   | yā,   |
| shuh  | shā,  | zuh   | zā,   | suh   | sā,   |       |
| tshuh | tshā, | tchuh | tchā, | tchōt |       |       |
| ong   | ung   | āng   | ing   | ēēng  | oong  | ong   |
| eung  | ōōn   | yeng  | yeong | yong  | yeūng | yeung |
| yeeng | ok    | uk    |       |       |       |       |

*Note on the above*

NOTE — With the above interesting paper I received from Mr Campbell a specimen of the Lepcha character, in the text and running hands, as well as the alphabet, the sounds of which are given above, in the letters expressing each sound. Mr Csoma Korosi informs me that these characters, and the language itself have no affinity to the Tibetan, nor to any dialect of it, nor to the dialects of any other oriental language with which he is acquainted. To give a correct lithographed copy of the Lepcha character would be impossible, without submitting the impression to some one acquainted with the language, as the letters are complicated, and very peculiar. It is my intention to await the receipt of Mr Campbell's promised notices of other Hill tribes, who may have, like the Lepchas, a character of their own, or whose language, exhibiting a mere dialectic difference from the Lepcha, may be expressed in symbols not dissimilar to those now before me. Availing myself meanwhile of Mr Campbell's assistance in correcting the lithograph of the Lepcha alphabet, I shall be in a position to compare this and the vocabulary with other (possible) characters and tongues in use among neighbouring septs, the affinity of the language may be thus in some sort ascertainable, as forming, perhaps, with its dialectic differences, a distinct family. This may lead to a result in philology which students in the science, as illustrative of general history, might possibly turn to some account.

*Notice of some counterfeit Bactrian coins*

Several forgeries of ancient Bactrian coins having within the last eighteen months come to my knowledge, I am induced to make them public, as a caution to our countrymen in Afghanistan, who are so zealously engaged in collecting these rare and valuable relics of the Grecian power in upper Asia — I cannot better commence this notice, than by quoting the following passage regarding a square silver coin of Amyntas from an article in the *Journal des Savants* for February 1839, where

Mons. Raoul-Rochette says, "what renders me also a little "suspicious regarding the silver coin of Amyntas is, that I observe there, with the exact repetition of the copper coin published by Mr Prinsep, the sloping cut in the lower part of "the coin—which, whether an accident attributable to its make "or to its antiquity, does not appear to me to be reproduced "on any other coin of different metal, though of the same "mint "

From this description I feel convinced that this silver coin of Amyntas, which is of square form, and similar in all respects to that published by Mr Prinsep, is a forgery, cast in a mould formed from the identical copper coin published by Mr Prinsep, which belonged to Colonel Stacy. This coin, which was stolen from the Colonel in 1837, must have been carried back to the Punjab, from whence it originally came, where a forged silver coin was made from it, and sold to General Allard, who in 1838 forwarded a sketch of it to France, which arrived in time for publication in the *Journal des Savants* for February 1839. Such is the history of this remarkable forgery of a rare coin, which we may still hope to recover from the Punjab, along with the rest of Colonel Stacy's valuable collection. The lovers of numismatic science will be pleased to learn that a genuine copper coin of Amyntas, of square form, and similar in all respects to that which belonged to Colonel Stacy, but in less good preservation, exists in France in the collection of General Court, of which a description may be found in the *Journal des Savants* for February 1839.

Accompanying the sketch of the silver piece of Amyntas were sketches of two other silver coins of square form, both of Menander, and both acquired in the Punjab by General Allard. The reverse of these new coins were an owl, and the Macedonian buckle with Medusa's head—two types that were already known in copper, which circumstance has led M. Raoul-Rochette to suspect them to be "the work of some forgers." The fact of these two suspicious silver pieces of Menander having been acquired in the same year with the forgery of that of Amyntas, and by the same person, in the same country, united to their perfect identity in all their elements with copper coins

already known, and added to their shape and size, (that of a square didrachma, which is altogether unprecedented in any Grecian monetary system), all seem to render it highly probable that these two square silver pieces of Menander are likewise forgeries

Of the forged coins that have come under my own notice, I can speak with more certainty, the most remarkable of which is a gold piece of Apollodotus, of square form, and of small size, belonging to Col. Sir C. M. Wade, c b whose valuable collection of coins I was kindly permitted to examine in October 1838. This piece is identical in type and legend, in make and general appearance, with the square silver coins of that prince, which are so well known, and it has evidently been cast in a mould formed from one of the silver coins, for the edges of the gold piece are sharp, and bear the marks of the file, and the point where the metal was run in is easily known by the confusion of the letters at the *same* place on both sides of the piece I have seen about twenty of the square silver coins of Apollodotus, and I can vouch that this gold piece has not the same clearness and sharpness which is observable in the letters of the genuine coins, a circumstance owing to its having been cast, and not stamped. Besides which the only known *gold* Bactrian coin is of round form; which alone would lead me to suspect the genuineness of this new piece, but when to its square form (which is quite novel in gold) is added its perfect identity in type, size, and make, with the square silver coins of that prince, I have no hesitation in recording my belief that this is a spurious medal

The forgeries next in importance are two thick round silver pieces of Azes, of large size: only one of these pieces is of good silver, the other being of base metal. From some slight obvious variations, they have evidently been cast in moulds made from two different copper pieces of the commonest type of the coins of Azes, having the bull on one side, and the Indian lion on the reverse. The piece of good silver is covered on both sides with minute holes, which might possibly have been produced by the action of acid in cleaning the piece from rust, but its edge, which has been hammered all round, proves to my

mind that these minute holes have been occasioned by the piece having been cast, and these peculiar appearances, added to its identity of type, shape, and thickness, with the copper coins, prove it to have been cast in a mould made from one of the commonest copper types of Azes

The other piece, of base metal, has been manufactured by a less skilful person, for the edge betrays that the halves of the mould had overlapped each other, the projecting rough parts having been only partially filed away: the mouth of the mould is easily discovered by the obliteration of several letters of the legend on both sides at the *same* place, and there is a considerable flaw beneath the figure of the bull, the result of a large air bubble in the cast metal.

The genuine silver coins of Azes are, besides, of a different type, size, thickness and make, and are easily discernible by a practised eye.

The other forgeries which I have seen are of Indo-Scythic gold coins, and these from the barbarous make of the originals are not so easily detected. I have met with at least twenty cast coins of Kanerkas, which have a figure standing to the left on the obverse, and a figure standing to the front with a bull to the left on the reverse, with the legend OKPO; and I have seen four or five cast pieces with the same obverse, having on the reverse a seated female figure with the horn of plenty in her left hand and the legend APΔOXPO.

These spurious pieces which merely reproduce in nobler metals, types and names already known, are easily detected by any one conversant with the published coins of Bactria, and I trust that this brief notice will be of some small service to such of our countrymen in Afghanistan as may be only novices in numismatics.

A counterfeit of another kind, the work of an ancient forger, I hope soon to lay before my readers in a notice of a plated copper drachma of Antimachus

ALEXANDER CUNNINGHAM.

*A Second Memoir on Indian Tempests, with reference to the Theory of the Law of Storms —By HENRY PIDDINGTON*

PART II

On the 16th November, 1839, an awful hurricane visited Coringa, by which that station was nearly destroyed I have used my best endeavours to collect all the information possible, and the following, which I have first given in statements and logs, abridged where necessary, and afterwards in the tabular form as before, will shew the results of my labour It will be seen that we have for this hurricane thirty-two logs and reports, and that we have traced it from near the Great Andaman, in latitude  $13^{\circ} 20' N$ , longitude  $91^{\circ} 52' E$  to Coringa and Vizagapatam, our observations extending thus over about 654 miles in five days, and crossing all the Bay of Bengal

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Abstract of the log of the Brig "Arethusa," Capt Chaplin, from Madras to Calcutta Reduced to civil time

11th November, 1839 —At noon lat obs $16^{\circ} 11' N$, longitude $84^{\circ} E$

12th November —Increasing breezes EbN to NE East and ENE cloudy weather and rain, almost constant rain or squalls during the night 6 A M squally, heavy and constant rain 8 A M increasing breezes, appearance of an approaching gale Noon, strong breezes with frequent heavy squalls of wind and rain, wind ENE sun obscured, latitude $16^{\circ} 34' N$, longitude $84^{\circ} 20' E$ strong breezes ENE to NE cloudy 6 P M decreasing breeze, at 7 30 P M latitude by star $16^{\circ} 22' N$

13th November —From 9 P M to 4 A M increasing breezes and sea, dark cloudy weather, and heavy top sea Wind NEbN 8 A M. every appearance of an approaching gale 11 A M a very heavy squall, wind and rain, which hove the brig on her broadside for fifteen or twenty minutes Noon fresh gale NE under double-reefed topsails. No observation Latitude $15^{\circ} 52' N$, longitude $85^{\circ} 18' E$, strong gales NE throughout with squalls till midnight

14th November —At 4 A M increasing gale with very high sea, ship labouring and plunging very heavily 8 A M. Ditto gales, with fre-

quent heavy squalls of wind and rain to noon No observation Latitude $15^{\circ} 50' N$, longitude $85^{\circ} 46' E$ Noon, NE wind, severe heavy gale, frequent squalls of wind and rain, increasing sea to midnight

15th November —At 2 A M the same Hove to under close-reefed main top-sail, carried away flying-jib-boom and one shroud of the main rigging Noon, strong gales. Wind at 3 A M NE At 6, North At 8, NNW At 10, WNW No observation Latitude $16^{\circ} 00' N$, longitude $86^{\circ} 06' E$ P M strong heavy gale, WNW and constant rain 2 P M increased to a perfect hurricane, vessel lying on her broadside at 4 P M with wind at WSW At 9, wind SSW At 11, gale moderating with frequent heavy squalls Midnight, wind SSE

16th November —At 4 A M decreasing At 6 A M wind SE Bore up At 8, fresh breeze, &c cloudy to noon, when fine Latitude observation $15^{\circ} 30' N$, longitude $85^{\circ} 09' E$

17th November —Fine breeze SE throughout Latitude $17^{\circ} 33' N$ longitude $86^{\circ} 05' E$

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*Translation of an Extract from the log of the French Ship "Le Balquerie," Captain Thore Reduced to civil time*

At Noon, 12th November —Wind variable from W to NW heavy constant rain, strong squalls NW to NNW No observation Latitude by account  $11^{\circ} 36' N$ , longitude by account  $90^{\circ} 20' E$ . Bar 27 15 (French) or 28 95 English To midnight squally weather, continual rain, a swell from the eastward, wind from NW and NNW in violent squalls

13th November —At midnight the wind hauled to west, and towards daylight blowing strong from the SW with a considerable sea No observation Lat by account  $13^{\circ} 15' N$ , longitude  $90^{\circ} E$  Bar 27 82 French, or 29 66 English

14th November —Wind hauled to the SE At daylight squally, with heavy rain A heavy confused sea No observation Latitude by account  $16^{\circ} 20' N$ , longitude  $88^{\circ} 54' E$  Bar 27 8 French, or 29 64 English P M Cloudy, squally, and much rain and sea, wind North-easterly, with strong squalls towards night

15th November.—At daylight wind hauling to the east No observation Latitude by account  $17^{\circ} 56' N$ , longitude  $87^{\circ} 50' E$  Bar 27 9 French, or 29 74 English Cloudy, squally weather, squalls from NE to NNE with a good deal of sea

16th November —At midnight weather moderating a little, lightning in the SE quarter. At daylight squally and rain Wind at ENE. and E Latitude by observation  $20^{\circ} 10' N$  longitude  $88^{\circ} 49' E$  Bar 27 12 French, or 28 90 English Noon, fine weather, pleasant breeze from E to ESE At half-past nine saw the Lighthouse on False Point Palmiras, very close *Remarks* During the ten days from the Equator to Point Palmiras I may be said to have had constant rain

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*Extract from the log of the ship "Duke of Bedford," Captain Bowen,
bound to Calcutta Reduced to civil time*

12th November, 1839 —At noon, wind SE fine

{	Lat observation,	$11^{\circ} 41' N$
{	Longitude, . .	$91^{\circ} 21' E$
{	Barometer	30 00
{	Thermometer,	82°

13th November —Wind SSE. to EbS squalls and rain throughout
No observations

{	Lat per account,	$14^{\circ} 49' N$
{	Longitude,	$90^{\circ} 22' E$
{	Barometer, . .	29 90
{	Thermometer, . . .	81°

P M —Heavy squalls ESE At midnight Bar 29 80, and falling

14th November —Weather very threatening, and a low scud flying rapidly over Furl'd the topsails and up foresail During the forenoon blowing very hard Barometer stationary At 9 A M set close-reefed main-topsail, fore-sail, and main-trysail Got a glimpse of the sun at noon, found ourselves at least sixty miles to the northward of our account since noon of the 12th,

{	Latitude, . .	$17^{\circ} 35' N$
{	Longitude, . .	$90^{\circ} 20' E$
{	Barometer, ..	29 80
{	Thermometer, .	80°

A little after noon, blowing in heavy gusts 4 P M Bar 29 70
Down top-gallant-yards and struck masts

15th November —Up fore-sail and furl'd it. Torrents of rain throughout, with vivid lightning No observation

{	Lat per account,	18° 27' N
	Longitude, ..	89° 35' E
	Barometer, ..	29 80
	Thermometer,...	80°

Blowing hard at east, and heavy rain At 11 P M a sudden lull and calm, with vivid lightning SSE Clued up the main-top-sail At 11h 20m P M again freshening at east During the 14th and 15th a great number of land birds and dragon flies about the ship, some of the former were caught

16th November — Weather continued till noon No observation

{	Lat per account,	18° 20' N
	Longitude, ..	89° 05' E
	Barometer, . ..	29 90
	Thermometer,	80°

P M — Thick weather At present clearing off Made sail

17th November — A light breeze throughout, easterly At A M. sounded, 60 fathoms, blue mud And at noon,

{	Lat observation,	20° 42' N
	Longitude,	89° 45' E
	Barometer, . .	30 05

We have experienced a current of at least sixty miles to the northward since noon of the 14th

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*Ship "Cashmere Merchant," Capt Warren, from Calcutta bound to Rangoon Civil time*

12th November — At noon in lat 16° 58' N, long 92° 25' E with light breezes and clear weather, increasing at midnight to strong and increasing breeze from ENE and NEbE to ESE

13th November — Increasing, but wind as before Preparing for bad weather. Noon, no observation Wind east, and varying to ENE at times Midnight strong gales

14th November — Gale increasing ESE throughout No observation

15th November — Strong gales ESE heavy squalls and rain with a heavy sea. Noon, latitude by observation 17° 33' N Weather the same, till midnight. P M Wind SE

16th November — ESE. fresh breezes and clear Noon, latitude by observation 17° 29' N, longitude 92° 25' E Weather the same till midnight

17th November —The same ESE to SE breezes, and fine Noon,  
lat 16° 37' N longitude 92° 7' E

*Abstract of the log of the ship "Rosalind," Captain J Fenrose  
Reduced to civil time*

13th November, 1839 —Strong gales NE and squally, with heavy showers Noon, no observation P.M Wind NNE every appearance of an approaching gale 4 P.M Thick, cloudy, and very dark from the eastward Wind the same, hard squalls and rain, prepared for bad weather Hove to under close-reefed main topsail and reefed try-sail, very heavy cross sea Wind and weather the same at midnight

14th November —A.M Weather as before Daylight, hard gales NNE with heavy squalls of hail and rain Noon, no observation P.M and till midnight, wind North to NbW At 10 P.M hard gales and stormy weather, with tremendous cross sea, lying to as before.

15th November —A.M The same weather, with much lightning Wind veered to WbN at 2 A.M, to WbS at 6 A.M, and to SW at 10 A.M, at which time it was blowing a hurricane Sprung the main-mast-head At noon, wind SW, shipped a heavy sea, which stove in the door and windows of the round house Wind veering round the compass to SSW at 1 P.M. No observation The wind SSW confused sea, strong breeze (gale?) and squally during the afternoon At 6 P.M wind SbW Midnight, squally and rain

16th November.—4 A.M More moderate, and less sea at 9 A.M, made sail at noon Latitude by observation, 16° 15' N.

I was, unfortunately, not able to obtain a single longitude with this otherwise valuable log, so that I have been obliged to place the ship, by guess, on the track of the hurricane. Judging from the time of the varying of the wind, she must have been not far from the Ripley, and I have been guided by that vessel's very careful log, in placing the *Rosalind* Captain Fenrose concludes his communication with the following remarks—"I have been at sea 41 years, and have remarked that previous to high winds the wind is variable But previous to a hurricane, the sky is very clear You can see objects at a very great distance, the sea very smooth, and at night the stars are very numerous, more than at other times, and at times during the day small clouds are seen at an immense height, such as sailors call, 'Mackerel Sky,' and their appearance changes very fast, some parts having the colour of the rainbow If in north latitude,

the wind backs round contrary to the sun, it will increase, if in south latitude the reverse

"In the first hurricane which I experienced, in the Gulf of Mexico, the clouds of scud appeared to touch the masts, this was on the 18th and 21st August, 1827"

*Extract from the log of the Brig "Ripley," Yorke Steward, Commander Reduced to civil time*

*Thursday, 14th November, 1839*—On the 13th, at noon, latitude  $15^{\circ} 22' N$ , longitude  $85^{\circ} 05' E$  steering East and EbN Strong monsoon with hard squalls and heavy rain In the middle and latter parts of these 24 hours, wind steady at north, but gradually increasing and the mercury falling. At noon it was 29.65 Ther  $75^{\circ}$ , then blowing a heavy gale, ship under close-reefed main-topsail Noon, latitude by dead reckoning  $14^{\circ} 30' N$ , longitude  $85^{\circ} 21' E$  Ship's head to N.E Wind veering to NNW and NW Barometer at midnight 29.50

*15th November*—At 8 A.M. Bar 20.30, but not at all steady Noon, it was 29.25 Ther  $73^{\circ}$  Throughout these 24 hours a heavy gale, with incessant heavy rain, and severe gusts of wind, the sea comparatively smooth, ship lying to under storm trysail The last 12 hours the wind appears to have been blowing at its greatest fury Noon, latitude by account  $13^{\circ} 55' N$ , longitude,  $85^{\circ} 58' E$  Wind WNW At 4 P.M. West Mercury fluctuating from 29.30 to 29.40 6 P.M. Wind WSW moderating a little Bar rising Midnight, wind SW

*16th November*—6 A.M. SSW, at 9 A.M. SbE, and at noon SEbS, At 10 P.M. it ceased raining Strong breeze and fine clear weather, towards noon moderating to a fresh breeze and clear weather, latitude  $15^{\circ} 38' N$ , longitude  $86^{\circ} 57' E$  Bar 29.75 Ther  $80^{\circ}$  The following day the wind remained steady at SE and settled fine weather.

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Extract from the log of the Barque "Sumatra," Capt Langlois, from Padang towards Calcutta Reduced to civil time

At noon 12th November, 1839—Latitude obs. $15^{\circ} 29' N$, longitude $91^{\circ} 02' E$ To midnight fresh breeze, ENE

13th November—To 6 A.M., fresh breeze, ENE, 6 to 10 EbN, to noon ENE Midnight strong breeze, squally and rain Noon, fresh gale Latitude by observation $17^{\circ} 41' N$, longitude $90^{\circ} 42' E$ Wind ESE Wind ENE to 4 P.M. veering to East at midnight

14th November — Wind NEbE to 8 A M , ENE. to noon , increasing breeze with small rain Towards noon, squally appearance in the south-eastward, with a swell. Latitude account $19^{\circ} 08' N$, longitude $89^{\circ} 49' E$ Wind ENE to 2 P M , then East, and EbN $\frac{1}{2} N$ at midnight

15th November — Wind ENE at 8 and till noon P M Increasing gale and dark rainy weather, with a heavy sea At sunset, hove to , heavy gale, with constant rain, hard squalls occasionally to noon Latitude account $18^{\circ} 57' N$, longitude $89^{\circ} 34' E$ Hove to, till midnight

16th November — Hove to these 24 hours Wind ENE to E , heavy gales with a high sea, cloudy, dark weather, and increase of rain Sunset, heavy squalls, and rain at intervals Lightning to the southward Daylight, less wind Weather clearing up in the SW Latitude account $18^{\circ} 40' N$, longitude $89^{\circ} 12' E$ Wind ESE to 8 P M and SEbE to midnight

17th November — Wind SEbE to 8 A M and ESE. and EbS to noon Weather moderating throughout Latitude $20^{\circ} 30' N$, long $89^{\circ} 30' E$ P M fine weather

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*Report of Captain Campbell, Assistant Surveyor General, Baramahl Survey, to the Secretary to Government, General Department*

I have the honour to report to you, that the Barometers in the office of the Salem and Baramahl Survey, at present in quarters at this station, have marked the progress of the hurricane which appears to have visited Coringa on the 16th November The Barometers are two on the Syphon plan, and have been filled wet By continued comparison it has been found that the greatest difference between the two is about 04 of an inch, and the least 02 inch, which difference appears to be less than the error between Mr James Prinsep's standard Barometers The instruments may therefore be relied on From the observations, it appears, that the Barometer commenced falling here on the 6th November, and continued to do so regularly till the greatest depression was attained on the 20th, at 4 P M of the afternoon observation, and at 10 A M of the 21st November of the morning observation , from that time, it regularly rose until the 26th November, when it indicated the same pressure as on the 6th The greatest difference between the pressure on the

6th and the minimum was 0.16, of an inch, the morning and afternoon observations giving the same results. The weather has been settled since the 7th November. Before the 7th the wind was settled to about NE, and variable, afterwards veering about from N at W but in no regular manner, since the 26th it has settled at NE and East again. I believe an abstract of the observations of pressure would be of no use, as from the great height of this place, 3,250 feet above the sea, they would not be comparable with any other set. I do not therefore forward them.

*Royacotta, 4th December, 1839*

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Report of G. A. Smith, Esq. Collector of Coringa, to the Secretary to Government, General Department

SIR,—I have the honour to submit the annexed statement of remarks made by myself at the time at Samulcottah, about eight miles inland, those made by the Superintendent of the Lighthouse on Hope Island, off Coringa, and the extracts from the logs of the “Jane” and “Indian Queen,” relative to the storm which visited the Rajamundry district, on the night of the 16th ultimo. It has been observed to me, that though the inundation of the sea was attributable to the East wind, and had that continued a short time longer the consequences would have been still more disastrous, yet that the wind was actually stronger, and more damage was done to houses, &c after it shifted to the SE. This is also borne out by my own observations, since made, on the manner in which property has been damaged in different places, but still both remarks may be correct with reference to the positions in which they were made, particularly as the latter part of the storm came principally in gusts. The oldest inhabitants remember a storm of a like nature, and equally disastrous in its consequences which visited this district in the year 1787, since that time, there have been storms and inundations at intervals, the last having been on the 10th May 1832, but nothing in comparison with the present.

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*Observations of George A. Smith, Esq. Collector of the District of Rajamundry, on the storm of 16th November 1839*

On the night of the 16th instant, this district was visited by a most awful storm, attended by an inundation of the sea, which has

destroyed many villages on the Coast, and caused a very heavy loss of life, I fear, at least, to an extent of five thousand, including those from the number of vessels wrecked. According to my own observation, the storm commenced about 10 P M of the 16th from the North-East, it afterwards veered round to the Eastward, from which point it blew strongest, and after lasting six hours, ceased about 4 A M of the 17th, the wind having got round to the Southward. I had not the means of referring to a Barometer, but I have understood that the fall was about an inch

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Observations of Mr W L Pascal, Superintendent of the Lighthouse on Hope Island off Coringa, on the Hurricane of 16th November 1839

On the 16th November. 1839 Saturday, at about 8 A M it commenced blowing fresh from the North-Eastward, with mizzling rain, and continued so till 1 P M, when the wind shifted round to the NNW and terminated into a gale. About 2 P M the wind shifted to NW when the river commenced rising, and at 8, the Island was under water. At 10, the wind hauled round to the NE and blew a dreadful hurricane (during which time the water rose to about 2 feet in the Lighthouse, with a heavy confused sea beating against it, which burst open the door, and swept away every article in it, at this time the top of the Lantern wrenched and whirled itself aloft. The conductor broke into five pieces, and my house was completely washed away, with every article it contained. At 12 A M the wind shifted to the Eastward, and at 1 A M 17th, Sunday, it shifted to the South-Eastward, and blew tremendous strong, at 2 the water began to recede, at day-break the weather cleared up, and we found five corpses on the Island

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*Extract from the log book of Schooner "Jane," furnished by Capt Hazlenood*

*14th November — 1839* The Schooner "Jane" at sea, in longitude  $89^{\circ} 20'$ \* and latitude  $17^{\circ} 10' N$ . At 10 P M the gale commenced from the Eastward, and continued from that quarter till the 16th, and then the wind changed to the SE and cleared up. During the gale, we

\* This must be I think an error of the copyist's, for  $89^{\circ} 20'$  would require a drift of 250 miles to have made the last as subsequently mentioned. I suppose  $87^{\circ} 20'$  to have been the vessel's position. —H P

were drifted away to the Northward three degrees. On the 17th, made the land about Ganjam On the 19th, passed Vizagapatam, and were boarded by a catamaran, which informed me that four native vessels had been wrecked at that place, and the "Indian Queen" put to sea, leaving her Commander on shore. On the 20th, when steering for Juggernathpooram roads, saw the coast strewn with wrecks of native vessels, and passed 15 bodies of both men and women, and lots of buffaloes On the 21st came to an anchor in Juggernathpooram roads, and found the "Indian Queen" at an anchor, with the loss of her foremast and bowsprit

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THE LATE HURRICANE

Extract of a letter from Coringa, Nov 24, 1839 — "Indian Queen" outside

I have got the little finger of my right hand broken, so you must not expect a long letter, as I can hardly hold the pen I put to sea last Saturday morning at 1 o'clock, as the weather looked very threatening (in Vizagapatam roads) and at 9 o'clock a gale of wind came on At midnight we had our jolly boat washed away, pitched away the bowsprit, the foremast followed it, and main and mizen top masts Both pumps choked, and the ship making water When the boat went, it knocked in one of the stern ports, and filled the cabins All hands baling ship and cabins with buckets, and had one sea come over us, we must have gone down I assure you we have had a complete hurricane, and it is God's mercy we ever were saved, I never expected it When the gale abated, we were in 25 fms muddy water, and had it lasted another three hours, we should have been snug on shore Thank God we are safe Did you but see the horrible ravages the gale has committed at Coringa, you would be surprised, in fact it baffles all description Every vessel in the river, and miles up, are on shore and in the jungle, and all the vessels outside, with the exception of seven, are all wrecked Wrecks are lying about in all directions innumerable dead bodies of men, women, and bullocks Coringa is nearly washed away, Lighthouse, Flag-staff, and all Captain Pendygrass of the "*Catherine*," and Captain Marshall of the "*Charles Dumergue*," both drowned, with their mates and apprentices They were all on board the *Dumergue* at the time she broke adrift—went up the country sprung a leak and went down, and I suspect

these gentlemen must have jumped overboard, and never reached the shore, as the vessel has since been got up, but no bodies in her. She has sustained a dreadful loss. Oh ! it has been an awful gale. I can't help feeling thankful for our safety, when I witness the horrible devastation of property and loss of life at this place. I hope you have not suffered so at Madras. I will give you a full account in my next. Captain Shreeve, I am sure, has put us down for lost, long ago. I consider our safety a most miraculous escape. We left four vessels in Vizagapatam roads, all went on shore, were dashed to pieces, and every soul perished. Fancy *all that gale can do*—and then you will not guess half. Every person is starving here, nothing to be got for love or money, I would rather have been where I was, out at sea, than in the finest dock at Coringa. Every vessel has suffered, but poor Marshall and Pendygrass have been the worst, and their vessels too at a place where you would think no gale that ever blew could hurt them — *Madras United Service Gazette, Dec 4*

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AN AWFUL HURRICANE

Four days tappal (the 11th to the 14th inst) arrived simultaneously from Calcutta on Monday morning. The cause of their detention is found in the subjoined accounts of an awful hurricane experienced to the northward. It is most providential that at Samulcottah, where it appears to have raged with so much violence, not a life has been lost, but we fear that from seaward and the immediate line of coast where the agitated sea made irruptions, bad accounts will be received. The devotion of the faithful sepoy guard over the treasure, when the warring elements seemed to dictate a quest of the nearest shelter, will elicit warm approval.

*Samulcottah, 18th November* —The small station with its neat thatched cottages and well kept parade, is now a scene of desolation. It was visited on Saturday night by one of the most severe hurricanes ever known in this part of the country. It blew from 6 o'clock in the evening till 5 o'clock the next morning, carrying away the roofs of all the thatched houses, and leaving their inmates wet and shivering in the dread of the walls falling in upon them. Happily this was not the case, but, with the exception of the Collector and Commandant, every officer is houseless, and even theirs' have been much shattered, though tiled. The sepoys' huts have been totally blown to pieces, and their



families have taken refuge in the verandahs of the barracks One fact alone will illustrate the want of shelter now at the station —two native officers with their families are occupying the solitary cells *at their own request* Trees that have stood for eighty years are now blown down, even to the tamarind tree, which has generally such a firm grip of the earth A magnificent specimen of one in front of the Collector's Cutchary is fallen The whole country is under water, and the communication cut off from Cocanada and Ingeram, and we fear accounts from that quarter will bring us lamentable details of the loss of life and shipping

A hurricane similar to this occurred here in 1832, but not so violent, or of so long a continuance

Treasure to the amount of Co's Rs 1,50,000 was left unguarded on the plain ' but it was only for a short time, as the sentries who had been blown away, managed to crawl back and throw themselves on the bags ' A fine trait of devotion truly '

*(Another account) Nov 18*

'It may be interesting to you to hear some accounts of the late most awful hurricane we experienced here—from about 8 o'clock of the evening of the 16th, till 4 the following morning—when the raging elements began to subside, and when it became day-light, we were enabled to see the havoc that had been committed And indeed to behold the scene it was heart-rending all the thatched houses in the place unroofed—trees laid with the ground, and even some that must have stood all weathers for the last half a century The Lines were quite destroyed—*not* one house from right to left that has not been blown down, and as for the officers' houses, with the exception of the Major's, not one dry corner could be found, and the scenes that were resorted to, to try and save themselves from the wind and rain, each man the next morning recounting his adventures, certainly made us smile in spite of the awfulness of the scene Some got under tables, others under beds, some sat on chairs moving from one spot to another that could afford them shelter for the time, some were obliged to quit their houses and take refuge in the mess house, being a tiled building You can hardly fancy the wreck that the place is in, but just recall to your mind the scene that the Mount Road presented after the gale in 1836, and you *may* have some idea of how this place now looks—*not one whole* tree standing in the place—if not blown

down, all the large branches torn off, and only the trunk remaining—indeed we ought to be most thankful that no lives have been lost here. The accounts from Rajamundry are just as bad as this, and from Cocanada the reports are dreadful—that the sea has quite washed away the lower part of that village—from Coringa, and Nirapilly, nothing has been heard, but there is much alarm about their safety. We had a good deal of rain yesterday, and a good deal last night—which brought the Samulcottah river almost up to the only part of the old wall of the Fort now standing on the East side. The gale commenced about NE came round by degrees to the East and got about SE when it began to abate. The quantity of rain that fell is not known, as the Pluviometer was running over, and there is no knowing for what length of time. The Barometer fell about 1 inch from 12 o'clock on the 16th, till 12 o'clock of the 17th instant.

'To-day there has not been much rain'—*Spectator*, November 27th

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(Another account)

The subjoined particulars of an awful calamity with which Coringa and its neighbourhood have been recently visited, have just reached us. We lay them with a heavy heart before our readers, making no comment upon them, but leaving the sad tale of woe which they relate to speak for itself.

'We were visited on the night of the 16th instant by the most terrible gale of wind possible. Your house at Ingeram is completely unroofed, the trees and walls of the compound destroyed, and P*** was very nearly drowned. All the European and native houses are uninhabitable, and there is nothing to be seen from Coringa to this, but a heap of ruins.

The wind began to blow in the afternoon of the 16th, but was moderate till about 11 o'clock at night, when it became furious, and lasted till 4 o'clock the next morning.

The water from the sea rushed in with such violence, that the only houses remaining at Coringa, are ***'s large house, and three or four other brick built houses. All the rest, it is said, have been carried away. I have had $2\frac{1}{2}$ feet of sea water in my garden, and in my room which is under my bungalow, $1\frac{1}{2}$ foot.

It is said that more than 20,000 people have perished by this terrible hurricane, which lasted only five or six hours. There is nothing

to be seen in every direction but dead bodies and drowned cattle. Sixty native vessels which were in the roads, laden with paddy, have disappeared, and it is not known what has become of them. The "*Union*," although she had four anchors and chains out, was carried away, and is now laying at a short distance from the middle of the river of *Nellapilly*. The "*Catherine*," which was in a mud dock, and well secured by the earth, was also carried away, but fortunately got into the "*Charles Dumergue's*" dock, which the last named vessel had left a few days before. The "*Charles Dumergue*" was drifted into the large river of Yanam, and is now half buried in a sand island, opposite where the ferry boat crosses over, but no news at all of her captain who was on board, and also of the commander of the "*Catherine*," his brother-in-law, and a few other people. They might have been all drowned, as all over the country was nothing but like the sea. You can have an idea of it when I tell you, that I see from my house a Choolia sloop lying quite near the white pagoda of *Onagalo*, which is four or five miles from Coringa in the interior of the land."—*Madras Herald*, 27th Nov

VIZAGAPATAM.—The first five days fresh NE monsoon,—the two last days a heavy gale, as hereafter described

'The appearance of the weather on Friday evening, the 15th, betokened a gale, which commenced increasing during the night, when it blew hard on Saturday morning the 16th, with heavy squalls of rain from NE to North, which continued, mostly from the North during the day.—The barque '*Indian Queen*' put to sea in the course of the night on Friday, and in the strength of the gale on Saturday, about 11 A M, four Native craft (lately from Arrakan with grain on board) put to sea. Two others in a most unaccountable manner having cut their cables and made sail came on shore against the Northerly (off shore) gale.—The gale veered back to the Eastward, and blew hard during Saturday night from ENE to East without much rain, and on Sunday morning it moderated a little, shifting to the SE when it became more moderate, with occasional showers, and veering to South still more so, but continued to blow a fresh breeze from that quarter during the night. Monday morning the gale had subsided, and the wind was light and variable, with squalls of rain from W to NW.—Noon, light variable winds from the Westward with unsettled and cloudy weather. It is said that nine hands are missing

from the crews of the two vessels wrecked here, and apprehensions are entertained for the safety of the Native craft that put to sea two men were saved by the six tide-waiters and their catamarans off the Port'—*Madras Herald, 27th Nov*

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*Report to Government, by Charles Hawkins, Esq Master Attendant,  
 Vizagapatam*

For several days previous to the 16th and 17th November, it had blown a fresh North-east Monsoon wind, and two days previous, the sky had assumed a reddish, brassy, and cloudy appearance, particularly so, on the evening of the 15th, it still blowing fresh from the north-east, which increased steadily from the same quarter, during the night, to a decided gale, which blew hard on the morning of the 16th, when it veered to the northward and blew hard the whole day, varying from NE to north, (mostly north) with occasional heavy gusts of wind and rain, the strength of the gale blowing about 10 o'clock A M In the evening the wind veered back to the eastward, and blew hard, and steadily during the night from ENE to East, without much rain On the 17th, morning, it moderated a little, and shifted to the south-east, and veering to south, it became still more moderate with occasional showers of rain during the day It blew a fresh breeze from the southward during most part of the night of the 17th, and on the morning of the 18th the gale had subsided, wind light and variable, with squalls of rain from West to NW Noon, light variable airs from the westward, with cloudy unsettled weather

N B —'This gale was not felt at the Military Cantonment of Vizianagram, distant N by E thirty miles, nor was it felt at a Military post forty miles west, where they had but a few squalls of rain with the monsoon strength of wind From reports from the adjoining southerly district of Rajamundry, those parts must have experienced much heavier weather than has occurred in this district I have seen it blow much harder here, during twenty-three years service at this port, but I have never seen a heavier sea, the surf breaking in nine fathoms water

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*Extract from the log of the Barque "Indian Queen," in Vizagapatam
 Roads Civil time*

15th November, 1839 —Strong breezes and cloudy weather, but discharging cargo

16th November — At 1h 30m A M of this date, the weather assumed a very threatening appearance. Slipped both cables, and stood to sea under a press of sail, to obtain an offing, wind from N to NNE and at 9 A M NE strong gales, drizzling rain, and a high sea. Gale increasing at noon, hove to under main trysail, and made every preparation for bad weather*. At 6 P M wind ENE. Gale increasing, with a heavy sea. At 7 A M jolly-boat washed from the stern and knocked in one of the stern ports, which admitted a great deal of water, both pumps choked, and all hands baling. Midnight, heavy gales, with violent blasts of wind every minute, and a high sea, all the sails blown away from the yards, though lashed to them. Wind veering from ENE at 6 P M to SE by midnight.

17th November — At 1 P M the gale increased to a complete hurricane at SE, pitched away bowsprit, foremast, main and mizen topmasts, put before the wind, which was at ESE to save the rudder, and clear away the wreck, and hove to again. At 2h 30m A M trysail and gaff blew away. Wind at ENE for one hour (1 to 2), but SSE by half-past three, and South at 6 A M. Heavy seas striking the vessel, which kept all hands baling. At daylight the weather, as before with a heavy cross sea running. At 6 gale abating, ship rolling gunnels under, made a little sail, wind at SW. by 7½ A M when sounded in 25 fathoms, and saw Juggernautporam, bearing West Noon, strong breezes SW with a heavy swell. No observation P M. Wind South, came to in 7½ fathoms. On the 18th fine weather.

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*Abstract of the log of H C Steamer "Ganges," Capt Dicey, from  
Calcutta to Moultmein, under sail Civil time*

12th November 1839 — From midnight to 4 A M moderate breezes and hazy weather, wind EbN. At 8 increasing with a confused sea on Noon, fresh breeze EbN. Latitude observed 18° 09' N, long 88° 33' E. P M Strong increasing breezes, and dark gloomy weather with increasing sea, wind ENE. At 4 P M dark and threatening till midnight.

13th November. — Wind EbN till 10 A M. Squally and dark gloomy

\* Captain Shreeve informs me that at this time he considers Vizagapatam to have been bearing N W 70 miles from him. The gale did not extend as far North as Ganjam, nor South to Masulipatam.

weather, appearance of a gale Hard and increasing gale, made all snug, vessel labouring much 10 A M wind ENE till noon, when hard ENE gale with very high sea No observation Latitude by account  $16^{\circ} 21' N$  longitude account  $88^{\circ} 51' E$  P M Hard gales ENE dark gloomy weather 6 P M Barometer 29 00 At 8 *weather apparently moderating* Midnight, strong gales with a high sea Bar 29 0

14th November — Strong gale at ENE dark gloomy weather, with a very high sea striking the paddle box, cabins, and sponsons with tremendous violence At 4 A M the same, with heavy rain At 6 wind east, high sea running At 7 wind ESE At 8 put on steam, full power, but could not obtain steerage way, wind EbS Noon, fresh breezes, with very heavy sea running, drizzling rain, ship labouring much No observation Lat account  $15^{\circ} 37' N$  long account  $88^{\circ} 38' E$  Barometer 29 20 1 P M wind SE $\frac{1}{2}$ S Weather apparently clearing, made some sail 7 P M squally with rain 8, strong increasing gales and dark cloudy weather Midnight the same

15th November — SE wind, hard gales, lightning to the northward, and SE occasionally Daylight, strong gales and dark gloomy weather At 8 A M decreasing gale and cloudy, but a high sea on Noon, more moderate Latitude by observation  $16^{\circ} 17'$ , longitude by Chron  $89^{\circ} 40' E$  Barometer 29 20 1 P M wind SE as before, decreasing breezes and cloudy 4, fresh breezes with dark gloomy weather, passing squalls, rain, and a heavy sea At 8, the same At midnight stiff breeze, with alternately clear and cloudy weather Barometer 29 30

16th November — Wind SE fresh breezes and cloudy At 2 A M light breezes 5 A M Wind SEbE At daylight fresh gales At 8, Barometer 29 50 Decreasing strong breeze, with a high sea At 10, weather clearing up At noon, moderate and clear Lat by observation  $16^{\circ} 16' N$  longitude  $90^{\circ} 55' E$  At P M wind EbS moderate and fine till midnight

Captain Dicey remarks, that "before the gale came on with him, the weather appeared threatening, with a cloudy and gloomy sky, the Barometer fell very suddenly to  $29^{\circ}$ , and during the breeze the wind was from SSE to the NE After the first blow, it broke a little, and I put on the steam, and managed to make a little easting, and although it came on again, it was with less violence, , after which I found as I progressed to the eastward, the gale became less violent,

and had a very heavy confused sea, with hard gusts of wind at intervals, and I think we experienced this storm with less violence than other vessels further to the westward "

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Capt West, H C Steamer "Enterprize," informs me as follows —

We had no bad weather, to speak of, across the Bay from Akyab, but whilst there, on the 13th, 14th, and 15th, of last month, the weather was rather threatening from the eastward The "Amherst" left Akyab on the 15th, and I understand they had a fresh breeze across from ESE We left Akyab on the 16th, and experienced a heavy swell from SW to SSW and as we got over to the westward it was rather squally, but not of the least consequence The swell continued till we got well up the Eastern Channel, but we had no wind We arrived at Calcutta on the 18th November

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*Extract from the log of the "Helen," Capt an Henderson*

13th November, 1839 —Moderate breezes from NE to ENE throughout the 24 hours, all sail set by the wind Latitude at noon 19° 00' N, longitude 88° 30' E

14th November —The first 12 hours squally, with rain from NE and eastward Latter part steady breezes from the ENE Latitude noon 20° 10' N, longitude 88° 35' E

15th November —Moderate breezes from the eastward, with cloudy weather At daylight passed close under the Floating Light Vessel's stern and hailed her, but could not get a pilot (none being on board her) At 4 P.M. were advised by one of the Pilot brigs to stand to sea, the weather having a very threatening appearance, and the wind increasing fast At 6 P.M. put the ship under double reefed topsails and foresail, down royal yards, &c Fresh gales, with strong squalls Sun obscured

16th November —Ditto weather with rain At 6 A.M. wore ship and stood to the NNE wind East At 4 P.M. sighted a Pilot brig, which signalled to us to stand to sea, fresh gales with heavy squalls The Pilot brig off the Eastern Sea-Reef was at anchor on the tail

17th November —The first part of these 24 hours, fresh gales with hard squalls Latter part, moderate winds from SEbE and clear weather, latitude 20° 22' N, longitude 87° 25' E

*Extract from the log of the H C S "Amherst," 13th to 17th  
November, 1839*

**13th November** — At anchor in Akyab harbour At midnight, wind moderate at north, and threatening appearance

**14th November** — Wind N, NNE, NNW, NW, NE, and at midnight North, moderate, and light threatening appearance at daylight. At noon clearing, but dark to the westward Bar at noon 29.90 At midnight, moderate, but inclined to be squally and a threatening appearance

**15th November** — North to NNW. and NE At noon, moderate  
 8 A M Bar 29.94 and light air, but threatening appearance Noon,  
 Noon 93 looking better, weighed, and crossed the bar  
 4 P M 80 Bar fell to 29.80, heavy swell from South, at  
 8 — 84 8, moderate Northerly wind, and cloudy Mid-  
 Midnight 86 night fresh breezes, and cloudy, heavy swell  
 from SSW

**16th November** — To daylight wind North to NNE fresh breezes,  
 4 A M Bar 29.86 cloudy, and squally, threatening appearance to  
 8 — 89 the W Daylight, strong breeze and rain, and  
 Noon 91 wind NE, very threatening appearance to ESE  
 4 — 86 Noon, wind east, moderate, lumbering swell  
 8 — 90 from ESE and a cross swell all ways Lat D R  
 Midnight 88 20° 48' N, lon Chr 90° 13' E P M, Wind east,  
 threatening to SE and swell from SSE but in-  
 clined to clear 8 P M Lat by ( 21° 12' N, at  
 9 P M 12 fathoms water Midnight moderate and  
 cloudy, threatening to Southwest-ward 11 fa-  
 thoms water

**17th November** — Moderate but squally, threatening to SE and SW  
 4 A M Bar 29.82 sea moderate, wind east 1 A M Floating Light's  
 8 — 86 signal WbN  $\frac{1}{2}$  N  
 Noon 90

*Extract of a letter from Dr Cumberland, Civil Station, Pooree*

The gale which prevailed on the Madras Coast in the middle of November, did not extend to Pooree On the 10th November we had light winds from the north, and in the afternoon SE with cloudy



weather On the 11th, moderate breezes from NE and cloudy weather 12th, NE to E cloudy 13th, NE fine weather and fresh breeze 14th, NE Moderate breeze, and fine weather 15th, NE to ENE strong breeze, cloudy with rain (nine-tenths of an inch,) 16th, NE to ENE strong breeze At 5 P M squall from ESE and a little rain (one-tenth) 17th, ESE rather cloudy At 4 P M SSE then E to NE At 5 P M ESE light winds

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Captain Elson, Master Attendant at Chittagong, in forwarding the following register kept by Lieut Young, Indian Navy, H C Surveying Brig "Hattrass" says —

We had no gale here, (at Chittagong) but about the 14th, 15th, and 16th November, we had very cloudy weather, with slight rain, the wind variable from NNE to SE but nothing approaching to a gale, although there was a heavy sea outside

Honorable Company's Surveying Brig "Hatterass"

Date	Hour	Place at Noon	Barometer	Thermometer			Winds	Remarks, November, 1839
				Att	Det	W. Bulb		
13th	6		29.98	76½	78	76½	North	Moderate breeze and cloudy weather
	10		30.01	76½	78	76½	NE	Moderate breeze and cloudy weather
	12	Lat Long	21 26 90 47	76½	78½	76½	NE	Moderate breeze and cloudy
	4 8		29.92 29.95	76½ 78	78½ 80	77 78	North North	Light breeze and cloudy Light breeze and cloudy
14th	6		29.95	78	80	78	NE	Moderate breeze and cloudy weather
	10		29.96				NbE	Mild breeze cloudy with heavy swell from Southward
	12	Lat Long	21 20 90 56	78½	80½	78	NbL	Moderate breeze and cloudy
	4 6 8 Midnight,	....	29.88 29.86 29.89	78½ 78 78	80 80	78 76	NbE ESE East LSE	Light breeze and cloudy—Do swell Fresh breeze and dark cloudy weather Fresh breeze Do weather—heavy swell Strong breeze at intervals with rain—Do swell
15th	6		29.90	76½	78	76½	ENE	Fresh breeze and cloudy to S Westward—[from Southward]
	10		29.90	76½	78	74	NE	Fresh breeze and cloudy—rain at intervals
	12	Lat Long	21 20 90 56	76	78	74½	NE	Moderate without rain—heavy swell
	4 6 8 Midnight,	....	29.87 29.86 29.86	76	78	76	East N Easterly N Easterly N Easterly	Light breeze and cloudy Light breeze and cloudy Violent and cloudy with rain,—Do swell Light rain—heavy swell,—Do rain

Honorable Company's Surveying Brig "Hatterass" (Continued)

Date	Hour	Place at Noon	Barometer	Thermometers			Wind	Remarks - November 1839
				Att	Det	W Bulb		
16th	6		29 89	76½	78½	76½	NE	Mdt breeze, heavy SSE Incrd swell—constant rain
	10		29 93				NE	Light breeze and cloudy
	12	Lat 21 20 Long 90 56	29 93	76½	78½	76½	NE	Light breeze and cloudy—Do rain Do swell
	4		29 85	76½	75½	76½	NE	Moderate breeze and cloudy
17th	6		29 94				NE	Light breeze and cloudy—Do swell
	10		29 97	78½	80½	78	NEbN	Light breeze and cloudy, heavy swell
	12	Lat 21 20 Long 90 56	29 92	79	81	79	NE	Light breeze and cloudy—Do swell
	4		29 88	80	82	80	SE	Light breeze and cloudy—Do swell
18th	6		29 93	78½	80½	78½	NE	Light breeze and cloudy, heavy swell
	10		29 97	80	82	80	NE	Light breeze and cloudy—Do swell
	12	Lat 21 28 Long 90 56	29 93	80	82	80	SE	Light breeze and cloudy—Do swell
	4		29 87	80	82	80	SE	Light breeze and cloudy—Do swell
Midnight	8		29 94	80	82	80	SE	Light breeze and cloudy—Do swell
							Variable	Light breeze and cloudy—Do swell
							SSE	Light breeze and cloudy—Do swell
							SSE	Light breeze and cloudy—Do swell

At Balasore on the 13th November, Captain Bond's report to Government, says—

13th—Ther 79 Bar 30 03* wind N With heavy rain

14th—Ditto 79 ditto 28 84 (?) NW to NE a strong breeze

15th—Ditto 80 ditto 28 82 NE rain and puffy wind

16th—Ditto 77½ ditto 28 84 NW to SE, decreasing wind

17th—Ditto 78 ditto 28 82 NE to NW strong breeze with rain

18th—Ditto 80 ditto 29 00 SE to NW clearing up for fair weather

N B —Wind stronger to the southward of the hills south of Choramoon, also more rain to the southward than to the northward On this coast no craft lost, but to the southward, at Choramoon, salt was hove overboard from two vessels, which ran into that river for safety

Extract from the log of the Ship "Maudstone," Captain Humble

Thursday, 14th November, 1839 A M —Squally, thick, unsettled weather Noon, steady breezes from the north-eastward, and cloudy At 3 P M sounded in corrected 29 956 43 fathoms At 6h 30m saw the Light Vessel, bearing WNW At 9h 30m came to in eight fathoms, veered to 40 fathoms of cable Light bearing SE Midnight, light winds and fine weather

Friday, 15th A M —Moderate breezes and cloudy At 8, breeze increasing At 11, strong breezes and cloudy, veered to 60 fathoms. Noon, more moderate At 4, strong breezes and Bar Corrected dark cloudy weather, the Barometer falling, made 4 P M 29 75 all snug, veered cable to 80 fathoms At 8, 8 29 77 strong breezes and cloudy weather Midnight 12 29 69 strong breezes and squally, with a heavy swell from the south-eastward, wind E

Saturday, 16th A M —Strong breezes and cloudy weather, wind 4 A M 29 75 EbN At 4, ditto weather, with a heavy swell 8 29 80 from SE Daylight, squally with heavy rain Noon 29 85 Noon, strong breezes, with heavy squalls and 4 29 85 rain At 4, ditto weather At 8, strong breezes 8 29 85 with constant heavy rain Midnight, ditto weather, with a heavy swell from the SE Midnight 29 95

* This should probably be 29° 30 or 29° 03

Saturday, 17th A M —Strong breezes from EbS cloudy with rain
 At 8, more moderate, with light rain Noon,
 6 A M Br 29 95 fresh breezes from ESE and cloudy weather
 Noon 29 90 P M Strong breezes and squally, with rain At
 Midnight 29 95 8, more moderate and fine Midnight, fresh breezes
 and cloudy weather

N B Captain Wimble having favoured me with the height of his Barometer, at noon, at Calcutta, I have been able to compare it with that of the Surveyor General's Office I have corrected his for the small amount of error—05 which it had It may be mentioned here, that this is the only instance in which out of thirty or forty requests during these researches, I have been enabled to obtain this very simple, but important datum'

I now place the extracts from the logs of the Honorable Company's Pilot Vessels and Floating Lights, in the form of Tables from the 14th to the 18th November, and these are followed by the valuable Barometrical observations of Mr Hudson, of the Honorable Company's Floating Light Vessel "*Hope*," and those of the Surveyor General's Office at Calcutta

Date, Civiltime	Names of Vessels	Situation	Winds, Weather, and Remarks
14th Nov 1889	Beacon, F L V	Outer Station, (21 04 { 88 27	On 13th Moderate and fresh NE and NNE breezes and fine On this day the wind veering gradually to the East and SE At midnight moderate F to ESE breezes, and unsettled appearance all round
	Krishna, P V	Mid-Channel, Reef Buoy W b N 2 miles	N F b N breeze and fine During the night strong Easterly breeze, and swell from the Southward
	Seahorse, P V	Cruizing Floating Light from W N W to NE	First part pleasant breezes North to NNE latter fresh from ENE to ESE
	Jane, P V ...	Cruizing Floating Light Vessel NNE to Ebs .. .	First and middle part pleasant breezes, NL to ENE latter variable and squally, with cloudy appearance to the North Eastward
	Hope, F L V ..	At anchor, Inner Station.. (21 26 { 88 07	From 4 P M Moderate Northerly breezes 8 P M Light Easterly breeze

Date of Observation	Names of Vessels		Situation	Wind Weather, and Remarks	
	Bear, F. L. V.	Outer Station			
18th Nov 1880				Fresh E to ENE breeze increasing to noon, with rain and squalls. At sunset strong ENE breeze with squalls and threatening weather. At sunset the same and heavy sea NNE. The same at midnight, blowing hard from E to ENE and heavy squalls of wind and rain, riding with 140 fathoms cable.	
	Krishna, P. V.	Reef Buoy Wh N 2	Mid Channel	Strong Easly wind and cloudy threatening appearance	
	Seahorse, P. V.		Cruizing South Channel	NEBL wind Very dirty appearance Noon, increasing and threatening to Eastward Made all snug	
	Jane, P. V.	Under weigh S Channel Buoy NNW at anchor S Channel Buoy NW		First part variable winds ENE to ESE Midnight, breeze increasing, very threatening appearance to the Eastward latter moderate gales ENE to East Threatening appearances all round At anchor with 100 fathoms cable	
	Hope, F. L. V.		At anchor, Inner Station,	In 4 p.m. moderate and strong ENE breeze cloudy and squally from E to SW with a heavy swell from Eastward 8 p.m. Unsettled weather, NE to ENE at midnight	

Date, Civil time	Names of Vessels	Situation	Winds, Weather, and Remarks
16th Nov 1839	Beacon F L V	Outer Station	A M blowing hard from E to EN E, with heavy squalls of wind and rain increasing at 4 A M from Eastward, and at day light the same. Wind from E to EN E. Noon the same, and cloudy to the SE. Sunset the same, with every appearance of a heavy gale. Midnight blowing very hard in heavy squalls of wind and rain and threatening to the SE.
	Krishna P V	Mud channel Reef Buoy W N 2 miles,	Strong Easterly winds and cloudy with rain
	Seahorse, P V	Cruizing between S Channel and Point Palmiras,	Wind from E to ESE squally and rain. At noon at anchor on Point Palmiras, on account of the strong westerly set
	Janu, P V	At anchor, South Channel	First part fresh gales from EUN to Ebs or ESE, middle from East, latter hard squalls from EN E to ESE with heavy rain at intervals, riding with 170 fathoms. At 4 P M gale increasing after a squall from Eastward, telegraphing vessels to stand out to sea
	Hope, F L V	At anchor Inner Station	A M fresh ENE breeze, squally and drizzly rain, and strong set from the Eastward. Noon, strong Easterly breezes, squalls, and heavy swell from Eastward. 8 P M NE breezes decreasing fast. Midnight moderate Easterly winds and squalls

Date, (1111) time	Names of Vessels	Situation	Winds, Weather, and Remarks
17th Nov 1857	Beacon, F. L. V.	Outer Station,	11 A M to Noon blowing fresh from F to ENE with heavy passing squalls and threatening to the SE 4 P M to midnight, blowing fresh from E to ESE and SE with heavy squalls and threatening to the SE
Krishna, P. V.	(cruising and at anchor SW by F L S Fbs	R. C. + Bu. N.	First and middle parts squally, with rain from East to SE. Latter light breezes East to SE and cloudy
Seahorse, P. V.	Off Point Palmiras, Northern part		Variable from NE to SE and blowing weather stood to the Southward during the night At 9 A M on Point Palmiras in 19 fathoms At 10 A M wind abating 3 P M Wind SE falling light
Jane, P. V.	At anchor South Channel Latterly, F L V SE E		First part strong breezes FbN to ESE Middle very squally, latter moderate breezes from ESE with occasional squalls, and very threatening appearances to the Eastward 11 A M Wind ESE
Hope, F. L. V.	At anchor, Inner Station		Moderate Easterly breezes from Ebs to ENE dark, gloomy and squally, with frequent showers of rain Noon as before 4 P M Moderating 8 P M, Moderate NE Midnight Ditto Easterly

Date, Civil time	Names of Vessels	Situation	Winds, Weather, and Remarks
18th Nov 1839	Beacon, F I V	Outer Station,	A V to noon moderate E to ESE and S with passing squalls and unsettled appearances. Day light, wind SE. 4 P M full midnight SE to S and heavy appearances to SE. On the 19th fine
	Jam, P V	Under weigh F I V about 5 L	Throughout the day squalls, with copious rain from E to S and SSW
	Hope, F L V	At anchor, Inner Station	Moderate NE breeze and clouds, 12h 30m squally. Wind veered to South 1h 30m heavy squalls from SW 2 P M wind veered to Eastward
	Seahorse, P V	South Channel	Light breeze, ESE to SE and S by E with squalls and rain in first part
	Krishna I V	At anchor F L S by L Ref Buoy SW by W	First part light Easterly winds, middle SE winds and rainy. At 12h 30m P M the wind suddenly shifted to the Eastward. Latter part light SSE wind

Barometrical Observations, Honorable Company's Floating Light Vessel "Hope," Captain Hudson, Lat 21° 26', Long 88° 17'

Date	Time	Bar	Ther	
14th Nov	8 A M	29 95	72	Moderate NE hazy
	Noon,	96	76	Ditto Northerly, ditto
	8 I M	95	80	Light breeze from Eastward
15th Nov	8 A M	29 91	75	Moderate ENE squally to Southward
	Noon,	92	76	Strong ENE cloudy
	4 I M	86	76	Ditto ditto ditto
	8 I M	92	76	Moderate NE and squally
16th Nov	8 A M	29 90	75	First ENE and squally
	Noon,	92	77	Strong Easterly breezes and unsettled
	8 I M	92	78	N Easterly winds decreasing fast
17th Nov	8 A M	29 91	77	Moderate Easterly winds, gloomy and squally weather
	Noon,	90	78	Ditto ditto, thick gloomy weather
	4 I M	88	77	Ditto ditto ditto
	8 I M	92	77	Ditto NE cloudy
18th Nov	8 A M	29 91	77	Moderate Easterly, and cloudy weather
	Noon,	98	79	Ditto ditto ditto
		92	78	Light Southerly breezes cloudy

Meteorological Register kept at the Surveyor General's Office, Calcutta, 1839

Nov	Bar Noon	Ther		
12	29 994	81 0	N	Cloudy, faint Sunshine,
13	30 018	81 5	N	Clear,
14	29 970	81 0	N	Partial Haze,
15	952	86 0	L	Cumuli and Haze,
16	972	81 0	Ebs	Cloudy,
17	976	82 1	S	Cloudy,

For more convenient reference, and as marking some striking contrasts, I have collected the whole of the foregoing logs and reports, with the exception of that from the Baramahl Survey, into the following tabular views, which comprise the winds and weather, &c at each position, at Noon, Civil time, of the day to which they refer

Tabular View of the Hurricane in the Bay of Bengal and at Coringa from 12th to 17th November, 1839

Date, Civil time	Names of Vessels and places	Wind and Weather,	Lat N	Long E	Bur	Temp	Ther	Remarks
Noon 12th, Nov 1839	Brig Arctura,	Strong increasing breezes ENE squally, ..	16 34	84 20				{ S W appearance of a gale In- creasing since noon of 11th Nov
	Balguerie, Fr	W to NW heavy squalls and rain,	11 36	90 20	28 97			{ Constant rain, squalls from { NNW at times
	Duke of Bedford,	SE Fine,	11 41	91 21	30 0		52	
	Cashmere Merchant,	Lt breezes increasing from NE to ESE	16 58	92 25				
	Sumatra,	ENE Fresh breeze,	15 29	91 02				
	At Vizagapatam,	NE Fresh NE Monsoon,						
	Ganges, (H C Steamer,)	ENE Fresh breeze,	18 09	88 33				{ Increasing P N and till midnight { ENE dark gloomy weather
	At Pooree, or Jug gurnath,.	NE to E clouds,	19 48	85 45			51	
	At CALCUTTA,	N Cloudy, faint sun shine, ..	22 34	88 22	29 99			

Date, Civil time	Names of Vessels and Places	Winds and Weather	Lat N	Lon E	Bar	Simp	Ther	Remarks
Noon, 11 Nov 1849								
	Arcturion,	NE fresh gale heavy squall.	10 02	85 18				{ 11 A M a heavy squall leaving the Brig on her beam ends for 15 or 20 minutes Every appearance of an ap- proaching gale Under double reefed topsails
	Ir S Balgourie,	W blowing strong	13 15	90 00	29 66			Considerable sea rising
	Duke of Bedford, Rosalind,	SSE to E by S squalls & rain, NNE squally cloudy, strong gale	14 49	90 22	29 90		81	{ P M heavy squalls ESE and night Bar 29 80 { Every appearance of a gale { Hove to 4 P M
	Cashmere Merchant, Ripley, Fr S Sumatra, At Vizagapatnam, H C St Ganges,	East varying to ENE ENE fresh gales, N E fresh Monsoon, ENE hard gales, dark gloomy weather	No Obs 15 22 17 41	85 05 90 12				Preparing for bad weather
	H C St Enterprise, Helen, H C S Amherst, At Pooree, or Juggurnath,	Weather threatening from the Eastward, NE to ENE moderate breezes, North, threatening, N E fresh breeze and fine weather	16 21 20 10 19 00 20 10	85 01 92 58 85 30 92 58				{ Very high sea all snug for a gale Bar 29 0 at 6 P M At anchor at Akvab All sail set At anchor in Akvab
	H C B Hattrass, At Balasore, Beacon, F L V	N E moderate and cloudy, North, with heavy rain, N E and NNE breezes mo- derate and fine,	19 48 21 26 21 28	85 45 90 47 87 10	29 97 30 03		78 4 79	Surveying vessel
	At CALCUTTA,	North, clear weather,	21 04 22 34	88 27 88 22	30 02		84 5	At anchor

Date (civil time)	Names of Vessels and Places	Winds and Weather	Lat N	Lon E	Bar	Sump	Ther	Remarks
Noon 14th Nov 1840	Arthusa, Fr S Balguerie	NF Strong increasing gales with frequent heavy squalls & rain, NE with strong squalls cloud and rain,	15 30 16 20	54 0 58 34	29 64			Very high sea Very labouring much, A heavy confused sea { Prepared for bad weather { thermometer 29 70
	Duke of Bedford, Rosland	Blowing in heavy gusts from East ward About NNE hard gales and stormy weather ESE increasing gales	17 30	40 20	29 50			Tremendous cross sea—living to No observation { Under close reefed main top-sail P W { veering to NNW and NW
	Cashmere Merchant Riplex	North Heavy gale and squalls	14 30	80 21	29 65		70	{ Squally appearance in the SL with a { swell
	Fr S Sumatra	ENE increasing breeze with rain,	19 05	80 49				Gale commenced at 10 P M
	Jane, At Vizagapatam	No report at Noon Fresh NE monsoon, brassy sky	17 10 17 12	89 20 83 26				{ Weather apparently clearing 1 P M { wind SE to S heavy sea
	H C St Ganges	About SE dark gloomy weather	15 37	85 45	29 20			At Akvab
	Enterprise Helen	Threatening from Eastward ENE steady breezes	20 10 20 10	92 35 88 35				At Akvab
	H C S Amherst	Light NNW to NE and threatening to West	20 10 10 15	92 35 86 35	29 00			{ Appearance of a gale and heavy sea { outside
	At Pooree	N E Moderate and fine	22 20	91 31				
	At Chittagong	NNW to SE variable and cloudy	21 30	90 36	29 07		804	
	H C Brig Hatra	NbE moderate and cloudy, About North strong breeze	21 28	87 10	29 06		79	
	At Balasore	NE Steady breeze and clouds	21 01	83 27				Veering to Eastward { At night strong Easterly breeze swell { from Southward
	Mandstone Beacon F L V	About NE Unsettled appearance						
	Krishna P V	NEbN and fine						
	Seahorse P V	About NNE Pleasant breezes	21 26	88 07	29 06			
	Hope L V	Northerly breezes moderate	22 31	85 22	29 07			
	At CALCUTTA	North Partial haze						

Date (Continue)	Name of Vessel and Place	Wind, and Weather	Lat ° /	Long ° /	Bar	State	Time	Remarks
Nov 15 th Nov 1877	Arctura, F S Balguerie,	WNW severe heavy gale frequent squalls NE to NNE cloudy squally weather	14 00 (11)	80 06				{ 2 P M Hurricane WNW At 3 P M set { scion her broadside with wind a WSW
	Duke of Bedford Cashmere Merchant	East blowing hard—rain, ESE Strong gales,	17 36 14 20	87 50 89 01	29 74 20 90		79	A good deal of sea { Torrents of rain throughout and vivid { lightning Strong gales, heavy squalls and rain { Sprung mainmast Tremendous sea { and vivid lightning Wind veering all { round the compass { (Leaving to under storm trisail—sea { smoother—wind veering by 4 P M to { West
	Rosalia d, R pley	About SWS Hurricane and rain, NWNW Hurricane	17 33				73	Leaving to
	Er S Sumatra	EN F increasing gale dark rainy weather	15 55	85 58	29 21			Appearances threatening In Vizagapatam roads
	Jane At Vizagapatam, Indian Queen, H C S R Ganges, Helen — Enterprize, H C S Amherst, At Pooree,	East, gale from the East NE fresh monsoon, red brass sky NE Strong breezes and clouds SE gale modg dark cloudy weather, Threatening from Eastward, Faster, threatening weather N L moderate and light airs but threatening, NE Strong breeze, cloudy and rain	18 37 17 42 17 42 16 17 20 10	89 34 83 36 83 36 89 40 92 58	29 20		At Ak, ab stood to sea from the Floating Light (Leaving Ak, ab at Noon, heavy swell (from South	
	At Chittagong	Variable NNE to SE cloud, slight rain, NE more moderate without rain NE rain and puffing wind, ENE Strong breeze and cloudy threatening, ENE Strong breeze squalls and threatening,	20 10 19 48 22 20 21 20 21 28	92 58 85 43 91 51 90 56 87 10	29 50		{ At anchor near F Light Bar falling { threatening weather	
	H C S Hatrass, At Balasore, Maudstone, P L V Beacon, Krishna P V Seahorse P V	ENE Strong breeze strong, threatening, N ENE (?) increasing and very dirty, threatening, ENE moderate gale threatening ENE Strong breeze threatening, East, cloudy and haz	21 03 21 04 21 26 22 31	89 23 83 27 89 07 88 22	29 90 28 52 29 92 29 90		{ Heavy sea rising { At anchor Reef Buoy Wb V Cruising, South Channel At anchor 100 fathoms cable out Heavy sea from Eastward	

Date, Civil time	Names of Vessels and places	Winds and Weather	Lat N	Lon E	Bar	Sump	Ther	Remarks
Noon 16th Nov 1839	Arethusa, Fr S Balguerie, Duke of Bedford, Cashmere Merchant, Rosalind, Ripley, Fl S Sumatra, At Samulcotta near Coringa,	S E and fine, E to ESE fine, East blowing fresh, ESE fresh breezes and clear, About SW SEBS fresh breeze and clear weather, ESE clearing up,	15 12 20 18 20 18 18 20 17 29 16 15 15 38 19 48	85 09 83 49 89 05 92 25 96 56 89 12	28 90 29 90 29 75	90 90	Gale decreasing from midnight P M clearing up Moderating and clearing up At 9 A M made sail Moderating at midnight of 15th Hurricane commenced at 10 at night Shifted to NNW at 1 P M NW 2 P M 10 P M Hurricane at NE Strength of gale at 10 A M — steering to Eastward in the evening Increasing gale hove to under main-try sail, and made all snug Bar 8 A M 29 50 Standing to sea from pilot station Cross lumbering swell from ESE At anchor Clouds to SE every appearance of a heavy gale Reef Buoy WbN 2 Near point Palmiras At anchor S Channel Heavy swell from Eastward P M wind deag fast from NE	
	At Hope Island Lighthouse off Coringa, Jane, At Vizagapatam, Indian Queen, H C Sr Ganges, Helen, H C S Amherst, At Pooree, or Juggurnath, H C S Hattress, At Balasore, Maldstone, F L V Beacon, Krishna, P V Seahorse, P V Jane, P V F L V Hope, At CALCUTTA,	NE blowing fresh, drizzling rain, SE cleared up, About NNE heavy gusts of wind and rain, NE Strong gales, drizzling rain, EBS moderate and fair, Easterly fresh gls & heavy squalls East, moderating, but threatening to ESE About NEBE Strong breeze, NE light breeze and cloudy NE to NW Strong brz & rain EBN Strong breezes, heavy squalls and rain, EBN blowing hard—heavy squalls and rain, E Strong winds cloudy & rain About EBS squalls and rain, E hard squalls and heavy rain East Strong squalls unsettled weather, EBS Cloudy,	16 01 17 42 18 16 20 48 19 48 21 20 21 28 21 00 21 04 21 26 22 34	82 16 83 26 90 55 90 13 85 45 90 56 87 10 88 23 89 27 88 07 88 22	29 91 29 93 28 82 29 85 29 92 29 97	78 1 77 4	77 51	

HURRICANE OFF THE PREPARIS, 21st Nov 1840

A little hurricane experienced by the "Cashmere Merchant," between the Island of Preparis and Point Negrais, is one of singular interest, for it much reminds us of the smaller whirlwinds seen on shore in tropical countries. By projecting the vessel's track and drift, it appears that this vortex—and it clearly was one—could not at the most have exceeded sixty miles in breadth. Its centre must have passed very close to the ship. The direction in which it was travelling, also differs from that of the preceding storm, being about NbW, and in this it approximates to the September one. We have no farther notice of this storm from any quarter. I have marked it upon the chart, and the following is the extract from the "Cashmere Merchant's" log.

*Extract from the log book of the Bark "Cashmere Merchant," Capt
F G Warren, reduced to Civil time*

On 20th Nov—At 5 A M the Island of Preparis bore SE about five or six miles distant. To noon calm P M strong breezes and heavy squalls ENE till midnight, standing to the NNW $30\frac{1}{2}$ miles, and to the NNE $14\frac{1}{2}$ miles till midnight.

21st November—Midnight, strong gales EbN with a heavy sea. Noon increasing to heavy gale at eastward, veering to north. 1 P M Wind North to NE. At 5, P M heavy gales. At 9 P M wind flew round to the westward, being about NW with a complete hurricane, and cross-sea, vessel thrown on her beam-ends, all the canvas blown from the yards, five shrouds of the main, and three of the fore rigging being carried away, and water up to the hatches on deck, cut away top-gallant mast and yards and sails from the yards to save the ship, sea making a clear breach over her. At midnight wind west, vessel lying on her broadside, working much, and making much water. At 5 P M the wind was WSW having moderated from about 2 A M. Noon, wind NE bore away for Coringa being leaky, and too much damaged to reach Rangoon. Lat by observation $16^{\circ} 4' N$.

We have now to consider what is the amount of the knowledge to be deduced from these data,—how it agrees with the theory,—and how the evidence goes to prove the track which I have laid down for the Coringa storm. I may refer here to what I have said in the preceding memoir, p. 585, Journal of the Asiatic Society, for June 1839, on the

subject of the uncertainty which besets us, either from the state of the weather, or other causes, rendering it impossible to ascertain exactly the ship's position, or the true direction of the wind I may add here, that we should further consider, that in a circle of 320 miles circumference,,or about 100 in diameter, each point of the compass includes an area of ten miles, which may be considered as a trifling error in a vessel's reckoning in bad weather, so that if the wind be marked a point wrong, and the vessel's situation also be only ten miles wrong, *and both these errors the same way*, we may thus find a considerable discrepancy appearing where none really existed I mention this for the information of those, who might perhaps look for more mathematical exactness than our data will allow, and because I am desirous of shewing how important correct observations are to us in tracing out, step by step, the truths or probabilities which we deduce from them

It will be more convenient to consider this storm under the following heads

I —The formation of the vortex, or circle of the tempest, and evidence for its form

II —Its size

III —Its rate of progression

I —The formation of the vortex, or circle of the tempest, and evidence for its form

We find that on the 12th at noon, (Diagram No I,) the Duke of Bedford, Balguerie, Sumatra, and Cashmere Merchant, were all on the eastern side of the Bay, between Lat $11^{\circ} 30'$ and $17^{\circ} 00' N$ and long $90^{\circ} 00' E$ and $92^{\circ} 30' E$ Of these, we find the Sumatra with the wind at ESE, and the Balguerie with it at WNW. both with a strong breeze, and from this last being opposed to the usual monsoon current of that season (which is from the northeastward) we may suppose a vortex to be commencing The monsoon seems to have been blowing steadily all across the bay, at least from the lat of 14° , for we find on this day the Arethusa two degrees to the eastward of Coringa, and the Ganges Steamer in the middle of the Bay, in about $18^{\circ} 30' N.$, all with the winds between East and ENE We may then conclude that the disturbing force, whatever this was, had only began to operate below the latitude of 13° , and near the Andaman Islands, and that its centre, deduced from the positions of the Balguerie and Sumatra, was about where I have placed

it for that day, in say $13^{\circ} 30' N$ and $92^{\circ} E$ The SE wind experienced by the "Duke of Bedford" is scarcely an anomaly, because of her proximity to the Andaman Islands, the mountains of which, being some of them 2000 feet high, may have operated, as all high ranges of land seem to do, by deflecting the winds into a different course I have therefore rejected her log for that day The "Cashmere Merchant" seems also out of the influence of the vortex, and too near the coast of Tenassarim The centre, if there was one, might have been further north or south, but I have preferred placing it nearly on a line with the general direction of the tempest on the following day Could we have obtained from these ships a single observation when in Calcutta, so as to test the accuracy of their barometers by a standard, these observations would have been far more valuable, but as I have before observed p 420, I could only obtain this in one instance out of about thirty applications made, while collecting information for the present memoir

2 On the 13th we find the circle in some degree formed, for we have, as will be seen by the Diagram No II, and tables

Wind

The Ganges,	ENE	Hard gale, high sea,
The Bedford, .	ESE	Heavy squalls and Bar falling,
Balgueric,	SW	Blowing strong, sea rising,

and with their positions on the chart, this will give the centre of the vortex, if there was one, about where I have placed it, in lat $13^{\circ} 42' N$ long $89^{\circ} 47' E$

The "Sumatra" seems to have run out of the influence of the vortex to the northward, and having no barometer, we cannot refer to its height The storm can scarcely be said on this day to have reached the "Arethusa," "Ripley," and "Rosalind"

It is worth noticing, that the three ships first mentioned had all been running *towards* this point from noon of the 12th, and the changes of wind which they had since that date are exactly such as ought to occur if a vortex had been forming, moving onward in the direction laid down, and they had been running into it

We have for the Barometers, that of—

The Ganges, 29 00 at 6 P M at which time she was about
on the meridian of the centre

The Bedford, 29 90, being 00 10 *higher* than on the 12th, the
centre having passed her

The *Balguerie*, 29 66, being also 00 71 *higher*, than on the 12th.

We have unfortunately no comparisons in Calcutta for these Barometers, if we had so, they might have proved of great value That of the "*Ganges*" was probably too low

On the 14th, at noon, we have (Diagram, No III)

Ganges, wind about SE clearing a little, heavy sea, Bar 29 20

Arethusa, NE increasing strong gales and squalls

Ripley, North, heavy gales, 29 65

Rosalind, about NbE hard gales and stormy

The "*Bedford*" it is worth remarking, had her barometer again falling on this day, with very heavy weather from the eastward The above winds, and positions of the ships, place the centre in about $14^{\circ} 28' N$ $87^{\circ} 11' E$

On the 15th, at noon, we have (Diagram, No IV) the "*Arethusa*" on her beam ends, in a hurricane which veered in 18 hours—or from 3 A. M. when it was at NE to 9 P. M. when it was at SSW and moderating—22 points, or about $1\frac{1}{4}$ point in an hour I presume that she must have been blown round the western side of the vortex, though so far clear of its centre, that the calm which is usually found when the ships cross the centre, and experience *sudden* shifts, did not occur with her The "*Ripley*" we find also in pretty nearly a hurricane as to the force of the wind Her barometer as low as 29 25 at noon, when we find the wind WNW veering to WSW by 6 P. M., or about four points in six hours, or at the rate of about $\frac{3}{4}$ of a point in an hour, from which we should conclude, she was farther from the centre than the, "*Arethusa*." The "*Rosalind*" had a hurricane at from WbN at 2 A. M. to SW and SSW at 1 P. M., or veering seven points in 11 hours, or also about $\frac{3}{4}$ of a point in an hour, from which coincidence, and the direction of the wind, I have placed her on the same circle as the "*Ripley*," having most unfortunately no better datum to go by

We have thus on this day, curiously enough, three ships blown each half or two-thirds round a circle! For the unprofessional reader should be told, that in weather such as is described in the vessels logs, of which I have always carefully preserved the expressions, a vessel does little more than drift bodily to leeward, as the wind veers with her

It will be observed, as to the extent of the storm, that the "*Ganges*," and "*Balguerie*" had both the weather moderating, and were getting farther from the centre The "*Bedford*" and "*Cashmere Merchant*," how-

ever, had still very heavy weather, but this was in the vicinity of the coast, and not *against* the usual direction of the monsoon at this period of the year, another instance in which, while a hurricane was fairly formed, and travelling across the Bay, the monsoon also rises to the strength of a heavy gale, as in the case of the hurricane of June, in my first memoir. To the eastward we find that the "Indian Queen" on this day was discharging cargo at Vizagapatam, and that the red appearance noted there, is the only indication of any change of weather, in the absence of the barometer.

On the 16th we find that the "Ripley," "Arethusa," and "Rosalind" had all fine weather, and again by noon they had borne up and made sail, so that the hurricane must have moved very rapidly past them, and have been of small extent. We have for this day's data the somewhat vague accounts from Vizagapatam, Coringa, and the Hope Island Lighthouse, but fortunately also the "Indian Queen's" log.

That of the "Jane" is very imperfect, the circle or its influence seems to have been just reaching Vizagapatam at noon, for we find that during the morning "it veered to the northward, and blew hard the whole day, *varying* from NE to north, mostly north, the strength of the gale blowing about 10 A M, and that in the evening the wind veered back to the eastward, blowing steadily all night from ENE to east," showing that the centre of the vortex had passed somewhere to the south.

At Coringa itself we find some discrepancy in the simple report of the Collector, and that of the Lighthouse-keeper on Hope Island, which bears from the flag staff on Coringa, about EbS distant five miles. This last report would place the centre to the north eastward at the beginning of it, and yet according to the latter part of it, and to the Collector's report, it must have passed to the southward. I suppose these anomalies in the direction of the wind, as well as any which may have occurred in the direction of the storm,—for I take the Lighthouse-keeper's report to be the correct one, as to the direction of the wind, which as a seaman he was most likely to estimate correctly—to have been owing either to irregularities which *do* occur near the centres, or to have been caused by the deflection of the first efforts of the wind against the chain of the Rajamundry hills, to the northward, and not far inland, against which, the direct line of the storm from seaward was impinging, and by the opening of the valley of the Godavery. From the log of the "Indian Queen," I have placed the centre at noon about where it is marked,

and I take it to have passed over the meridian of Coringa, to the southward, and at a very short distance, about midnight of the 16th and 17th, or early in the morning of the 17th. We have no farther news of it inland. Samulcottah, from which some reports are dated, is about fifteen miles north of Coringa, but within 7 or 8 of the coast. I wrote to the Collector of Coringa for further information as to the storm inland, but have no reply. By the Lighthouse-keeper's report, we find the rise of the river to have begun at 2 P M of the 16th. Now as this was owing to the damming up of its waters by those of the sea, and not to any inland fall of rain,—for the inundation was one of *salt* water, a wave, or rise, forced in over a low country—we may suppose this to have a little preceded the vortex, which thus becomes, as I have made it, one of about 150 miles in diameter. This agrees with the position of the “*Arethusa*,” which vessel we find at this time bearing up at 6 A M with fine weather, and the wind at SE at noon, being out of the storm.

I trust that to those who will take the trouble to follow these observations, referring to the diagrams which are upon the same scale as the chart, will be satisfied that there is as good evidence as the nature of things will allow, for the track which I have assigned for this storm.

II *The size of the vortex*

It will be seen by the chart and diagrams, that this is a remarkable instance of a storm *decreasing* in size as it progresses, but apparently *increasing* in violence. The diagram of the 13th, No II, where we have the “*Ganges*” with a severe gale at ENE, the “*Balguerie*” with it at SW, and the “*Bedford*” at ESE, all with their positions well ascertained, and including thus 22 points, or $\frac{1}{3}$ ds of the compass, may be taken I think, as a fair instance of a circular storm, about 300 miles in diameter. That of the 16th where, though the hurricane—for it certainly *was* one there—had just left the “*Arethusa*,” “*Rosalind*” and “*Ripley*” a few hours, was but just touching Coringa, Vizagapatam, and Samulcottah, and had fairly begun with the “*Indian Queen*,” may be taken as proof that it had then contracted to about 150 miles, and was blowing with much greater violence. There is no instance in this hurricane of any vessel having been becalmed while the centre of the vortex was passing, so that we must either suppose that there was no calm at the centre, or that no vessel passed directly through it. This is a distinction worth being borne in mind for future guidance.

III *The rate of progression of the Storm*

If our centres are correctly laid down, we find that the storm must have advanced from the 12th to the 13th about 150 miles,

13th	.	14th	.	159
14th		15th	.	62
15th	.	16th		160
16th	.	17th	..	123

Total, 654 miles in five days

or 131 miles per day—or about $5\frac{1}{2}$ miles per hour, on a line about N 71 W a rate which does not very greatly exceed that of the storm of June. The apparent check in the rate of motion between the 14th and 15th, if it really occurred, is curious. The centres on those days are tolerably well ascertained, and I should be inclined to suppose them, as correct as the others

I cannot close this second memoir, without repeating that from every officer connected with Government, and from most of the mercantile community, I have met with the most zealous assistance. The Marine Board, through their indefatigable secretary, Mr Greenlaw, the Bankshall, through Captain Clapperton, and Captain Biden, Master Attendant at Madras,—to whose kind attentions I shall have particularly to refer in a future memoir,—have all vied with each other in forwarding the collection of materials for me, and indeed, though it is strange to say it, the only class of persons whose co-operation was especially necessary, and who were somewhat dilatory in according it, is that for whose especial use and benefit it is intended '—the commanders of ships.' To this however there are, I am happy to say, some very honorable exceptions, and I trust that as the uses, objects, and success of our inquiries become more evident, we shall have less reason to complain on this score. The negligent commanders may reflect that there can be no harm done, in giving us the information, and to get safe off when others are dismayed, always reflects some credit, while, on the other hand, the most careful man may have his reputation and his prospects injured by a succession of misfortunes, against which the best safeguard is the knowledge we are trying to elicit

Notes on the Wild Sheep of the Hindoo Koosh, and a species of Cicada. By Capt. HAY.

$$\text{Genus Ovis Incisors } \frac{0}{8} \text{ Molars } \frac{6\ 6}{6\ 6} = 32.$$

Adult male 3 feet 4 inches at shoulder From nose to tail 5 feet 4 inches, head 1 foot, horns 2 feet 6 inches in length, tip generally broken, and 12 inches in circumference at the base, and turned spirally backwards and downwards, points afterwards incline forward.

A large beard from the cheeks and under jaw, divided into two lobes, neck ponderous, 14 inches long and 24 in circumference

It has no mane above General color pale rufous, inclining to grey, fading off to white beneath Muzzle white, beard on either lobe white, connected to a streak of long black flowing hair reaching to the chest Legs covered with white smooth short hair, belly white, tail small, short, and together with buttocks white.

Girth of body measured behind shoulders 4 feet

Has a lachrymary sinus, very perceptible on dissection, there being a deep cavity in the bone under the eye.

The hair is particularly electric

Thus differs from the Ovis Tragelaphus (of Dr. Smith), or bearded. Argali, in the following respects—

1st. In having a lachrymary sinus.

2d. In having no standing mane.

3d. In having no long hair on the knees.

4th In colour of horns, which in the species inhabiting the mountains of Mauntania (Morocco) are black.

A variety of the Ovis Tragelaphus, inhabiting the mountains of Upper Egypt, is represented as wanting the mane on the shoulders, but is nevertheless said to have long tufts of hair round the fore knees, which differs from the species inhabiting the hills of the Hindoo Koosh range, and now under description.

They are gregarious in flocks of about 40, and are usually led by an old ram

The female is inferior in size, and not so much of a rufous colour, and has small horns, inclining backwards and outwards about 6 inches in length. They produce their young in May and June. The lambs are the colour of the female, have a dark stripe down the back, and in front of the fore legs.

On my march with the army of the Indus from Kandahar towards Cabool, I observed a remarkable congregation of the insects commonly known by the name of *Cicadæ*, or *Tettigoniæ*, (Fab) which in no book on Entomology have I ever seen noticed. These insects, as far as I had hitherto observed in the Eastern Islands, where they are called *Trumpeters*, and in different parts of India, especially in the Himalaya about Simla, where their evening chirping must be familiar to all visitors, have never appeared to me in large societies, an individual person not being able to capture above a dozen of an evening. These likewise have always been confined to wooded countries, and the *Tettigonia* of Italy, and shores of the Mediterranean, the celebrated insect made sacred to Apollo, and mentioned by Virgil, *Cicada stridens*, is, I imagine, always found in thickly wooded countries.

In Afghanistan, where scarcely a tree is to be seen (generally speaking), I have been astonished at finding certainly not less than eight species of this insect; I believe them all to be new, because I have never before met with them, but I regret to say I have not a single book upon Entomology to refer to, and this note not being intended to identify species, but merely to show the very extraordinary numbers they were found in, I shall confine myself to the observations I made.

The first species of *Tettigonia* that attracted my notice was in the month of May at Kandahar, a very diminutive insect, which flew into our tents of an evening, this did not surprise me, because there are trees in the neighbourhood.

But at Jellowgheer, in the Turnuk valley, about fifty miles

from Kandahar, where not a tree is to be seen, or a shrub, excepting the jewassee, which grows in luxuriance, and a few tamarisk bushes, I discovered three larger species of *Tettigonia*, and fully as abundant as any flight of locusts I had ever seen. The prevailing colour was a deep orange, and the stems and branches of the tamarisk were covered with them, as hardly to be able to distinguish a particle of green, and their noise all day was unceasing. The jewassee bushes being at the same time covered with the empty scales of the pupæ, and shewing at once that these insects were bred on the spot otherwise I should have conceived they were only migrating. Our tents and tent ropes, as soon as pitched, were covered by these insects, in fact every thing looked yellow. They continued in equal numbers for several days march through the Ghiljie country, and I saw in all eight or nine different species. One scarce variety I discovered with pink wings, and another, far less active in flight, appeared upon the ripe ears of corn, and immediately they were approached made a heavy flight for a yard or two and fell to the foot of the corn, not again lighting upon the heads. The wings of this last species have not the transparency that all the others, excepting the pink winged variety, possess.

Fortunate indeed is it that Providence has formed these insects to live by suction, or their damage to the crops if furnished with the jaws of a *Locust*, would be irreparable. Their clinging propensities had, however, entirely deprived some branches of their shoots.

Now what appeared to me extraordinary was, that these insects should appear in this country, where there are apparently no birds or animals to feed upon them. Locusts where they appear in vast numbers, as in Africa, always have their destroyers following them; but here not a gryllivorous bird was to be seen, not even the *Vespertilionidæ* to disturb them at night. The only enemies they appeared to have, were some large *Libellulæ*, which pounced upon them, and carried off what appeared to be double their own weight.

The *Pupæ** at seasons must be very abundant, and might even in this country have afforded the Greeks food, as well as the *Pupæ* of the *Locusts*

* I believe I ought to have written *Larva* for *Pupæ*, as they only undergo a semi-metamorphosis

R G H

Note on the above

The readers of the Journal who would wish to compare the description of the wild sheep of the Parapomisan range with that of the Himalayas, will find Mr. Hodgson's full and accurate notice of the latter animal Vol iv Journal Asiatic Society, p 492 Capt Hay, in a letter to me, says, "The enclosed description of our wild sheep at Bamecan differs I think from the species in the Himalaya I have now three lambs in my room perfectly domesticated, but such places as they attempt to climb, show the nature of the mountains they inhabit, what think you of a couple of them setting to work to climb up my chimney, nearly perpendicular, but with projecting bricks here and there! I am anxious to observe their habits, and if any of my notes, &c &c &c"

Capt Hay has in a part of his note on the Cicada alluded to the possibility of the species of insect which he found in such numbers, on their "*larvæ*" furnishing an article of food to the Greeks, in the same manner as the locust Being curious to see whether any allusion is made by ancient writers to the locust, or Cicada, as an article of food in countries adjacent to Bactria, I referred to the ordinary and well known authorities for information Pliny alone has, speaking of the locust, (Lib xi cap 29) "*Tot orbis partibus vagatur id malum Parthis et ha cibo gratæ*" No mention is made of the insects in the accounts extant of Alexander's march (Arrian Quint Curt), nor even in Strabo (Lib xv) for the ordinary use of the locust as an article of food with the Bæotians, v Aristoph. Acharnes Act iv scene 7

(πότιρον ἀκρίδες ἡδιόν ἐστιν, ἢ κίχλαι)

The querist being informed, in reply to this, that "locusts are much better flavoured" (than thrushes) v also scenc 1 of the same act, where a Bæotian comes in selling them, calling them "the four winged" I did not like to publish the whole of Capt Hay's note, without remarking on what might have appeared startling



*Proceedings of the Asiatic Society.**(Wednesday Evening, 15th July, 1840)*

The Honorable Sir E RYAN, President, in the chair

Read the Proceedings of the last Meeting

Major R J H BIRCH, and Captain BROOME, proposed at the last Meeting, were ballotted for, and duly elected Members of the Society

A CAMPBELL, Esq Superintendent of Darjeeling, proposed by the Officiating Secretary, and seconded by Sir E RYAN

Rev A WALLIS, of Bishop's College, proposed by Sir E RYAN, seconded by the Officiating Secretary

Major POTTINGER, Bombay Artillery, proposed by Captain MACLEOD, seconded by the Officiating Secretary

J J TORRENS, Esq B C S proposed by the Officiating Secretary, seconded by Captain MACLEOD

Baboo RAMGOPALL GHOSE proposed by Dr J GHANT, seconded by Captain MACLEOD

Dr T THOMSON, the Curator of the Society, proposed by the President, seconded by the Officiating Secretary

Read letters from W J HAMILTON, Esq Secretary to the Geological Society of London, and J FORSHALL, Esq Secretary to the British Museum, acknowledging receipts of the 2nd part of the 20th Volume of the Transactions of the Society

Read a letter from Messrs W H ALLEN and Co, Book Agents of the Society in London, intimating their having paid the arrears of subscription, 24*l*, due by the Society to the Oriental Translation Fund up to the end of the past year

Library

The following books were presented —

Journal of the Royal Asiatic Society of Great Britain and Ireland, London 1839,
No 10 —*by the Society*

Oriental Christian Spectator, Bombay, May 1840, Vol I, No 5

Letter to Major General JOHN BRIGGS, on the discovery of part of the second Volume of the Jami-al Tawareekh of Rasheed-ul-Deen, by W MORLEY, Esq
—*by the author*

Committee of Commerce and Agriculture of the Royal Asiatic Society of Great Britain and Ireland, London 1839,—*by the Committee*

Soyutu Liber de Interpretibus Korani Arabicè editus et annotatione illustratus
Lugduni, Batavorum, 1839 4to 1

Lexicon Arab et Lat of Haji Khalfae, by Gustavus Fluegel, Leipzig, 1837
2nd Volume

Map of Hindustan in Nagree character —*by the Honorable H T. PRINSEP, Esq*
Cotton Trade of India, its future prospects, part 2nd

The following were received from the booksellers —

Recherches sur les Poissons Fossiles par L. AGASSIZ, Neuchatel, with plates

Histoire Naturelle des Poissons, par M C B Cuvier—Tome, 4 1839
avec Planches,—2

Journal des Savans, Octobre, 1839

Annals of Natural History, and Magazine of Geology, Botany, and Geology London, 1838, Nos 1 to 10

Literary and Antiquities

Read a letter from Mr W MORLEY, Barrister of Lincoln's Inn, forwarding a pamphlet on the Jam-i-al Tawareekh, a General History of Nations—which is to appear in the transactions of the Home Society. The discovery of portions of this curious work, the 1st Volume alone of which was hitherto supposed to be extant, is highly valuable, the first vol is the history known as the TARREEKH-I-GHAZAN KHAN the whole work consisted of 4 volumes, and was completed by its author, RUSHEED-OD-DEEN, about 709 Hej. The MSS now discovered came originally from Lucknow, and was found by Mr MORLEY, and subsequently other and later portions of it by Professor FORBES, in the Library of the Society in London. The portion of the manuscript that has as yet been found, commences with the eleventh race of the kings of Khutta, the previous part had not yet been traced, and unfortunately the date is not in consequence ascertainable, but the titles of the kings, "Rai Kugao," or "Kukao," seem to point them out as of that race with whom the numismatic discoveries in Affghanistan have made us acquainted, but the Officiating Secretary informed the Meeting that there was a chance of recovering the remaining portion from Lucknow, or from the Royal Library at Delhi, at one of which places he hoped traces of it might be found among the collection of other manuscripts. There was also a trace of the same work at Herat, and he had sent copies of Mr MORLEY's pamphlet to several influential members of society in different parts of the country, in order to endeavour a partial recovery of the Manuscript.

N B Since the above announcement, nearly 100 abridged copies of the pamphlet, translated into Persian, have been circulated to every person, and place, by whom, or in which, traces might be found of this invaluable work. The Officiating Secretary has had late intelligence from Lieut Conolly of the alleged existence of original MS of so very ancient a date at Bokhara, that he almost dares to hope that some portion of the work may be discovered in that stronghold of Islam. Suggestions have been made on the mode of effecting this.

Museum

A number of Coins from Ispahan were laid before the Meeting by the Officiating Secretary for their inspection, and were found to be not very ancient, but they were beautiful specimens.

Physical

The Officiating Secretary next submitted the Report of the Curator upon the specimens of Natural History in the Museum—with a proposition to the Society to purchase the specimens of stuffed animals and birds which were still remaining of Captain HAY's collection at Messrs Tulloh & Co's Auction Rooms. Captain HAY had written to the Society, wishing them to make an offer for the whole, as he was desirous of getting them off his hands. The Curator and Mons BOUTCHEZ had on this been to inspect the

specimens—many of which they found to be very valuable and in good preservation, but many had suffered from the neglected way in which they had been exposed in the Auction Room. Both gentlemen, however, strongly recommended the Society to make this addition to their Museum, if it could be done for 3000 or 3500 Rupees, the cost to Captain HAY, to make the collection, had been 26,000. Dr GRANT thought it a great pity that Captain HAY had not come to some resolution of this nature before, he doubted not Captain HAY paid every farthing of the sum stated for the collection. Dr G was in Cape Town when he commenced it. When the expense for the transmission of such specimens to the Society was taken into the account, he thought the Society would do well to give the sum required, and place them in the Museum, for it would cost considerably more to get similar specimens of their own.

Sir E RYAN, called the attention of the Meeting to the proceedings held regarding this collection on their first arrival in India, in 1838. A Committee was formed for the purpose of taking the subject into consideration, they highly approved of it, and an application was made to Government to furnish the Society with the means of purchasing the collection, but it was refused, on the ground, that specimens of birds, &c were, of too perishable a nature for a climate like India, but that they may be offered to some Society at home.

Sir E RYAN, did not think proper to purchase the collection by raising a subscription among the Members, as the object for which the Society was originally established was to obtain only Indian specimens, of which duplicates were to be sent to the Museum of the India House, and the purchase of foreign specimens merely for the purpose of comparison, could not well be done with any good results, unless there was a perfect Museum, and the funds of the Society could not raise it to that.

Dr GRANT begged to recall what he had before said, as he was then unacquainted with the circumstance now mentioned, and to concur entirely with what had fallen from the President, but he would in addition beg to suggest to the influential members of native society, that they should step forward, and now that so good an opportunity offers, purchase the collection themselves, and have a Museum attached to one of their institutions, the Hindoo or Medical College, by which means, and a very little outlay, they would save to the country this valuable collection. Mr E Stirling proposed that an offer be made to Captain HAY to place the specimens in the Museum at the Society's expense till a purchaser be obtained. Sir E RYAN said this offer had once been made to Captain HAY, but refused—he however had no objection for its being made again. The proposition was then put and carried nem con.

Read a letter from Captain HUTTON, 37th N I dated Candahar 24th May, regarding his 1st part of a tour to the Spiti valley, which persons writing anonymously in the public prints had reflected upon in a manner to hurt the author's feelings.

Captain H entered at some length into the subject, and expressed his desire to refund the advance made to him by the Society for the purpose of the tour, if doubts were entertained as to the mode of his having performed it, or as to the general originality of the information communicated. As no doubts were expressed, it was resolved to decline the offer of refund, and record the Society's sense of the value of the addition made to its Museum, in the Geological specimens procured by Captain HUTTON, during the tour in question.

N B The 2nd, 3rd, and last parts of the tour have since been received.

Erratum in the article on "Lightning Conductors," published in the last Journal.

It gives me regret to have to point out a serious error in my account of the accident by lightning which occurred to Dr Goodeve's house, in May, 1837. The distance of the part struck from Mr Trower's conductor, is twenty-two *yards*, instead of twenty *feet*, as stated in my letter.

The error was occasioned by my entrusting the measurement to a native assistant, who no doubt either contented himself by a guess, or unknowingly used the word *feet* instead of *yards* in his report. Illness prevented my making the measurement myself. Fortunately, however, the error does not in the least degree vitiate the argument, in which the accident was mentioned for illustration's sake alone. That the best conductor will not protect a radius of 60 feet (as Biot has assumed it would) is now proved by the history of so many lightning explosions, that an error in one is of no importance whatever. The reader will find in paras 10, 11, 12, 13, and 14, of my second report, sufficient facts to set this question at rest for ever.

My chief object in noticing the accident to Dr Goodeve's house was to shew, that one and the same explosion may fall on a conductor and also on other adjacent bodies, that is, that one conductor may not be capable of carrying off the whole of the electricity of a single flash, although the conductor remain unmelted, or even be not perceptibly altered by the heat of the discharge. This view is but strengthened by the occurrence as it now stands in the corrected account. The greater the distance, the more remarkable is it that the primary flash should have been subdivided, as in this instance. Let it be remembered that Dr Goodeve *saw* the flash strike both objects at the same instant.

I congratulate Mr Daniell on the occasion thus afforded to him for a further display of the peculiar tone, and temper, which characterized his first report. But I repeat here distinctly, that the error into which I have been betrayed does not in the slightest degree affect the inferences which *all* the facts recorded manifestly lead to—1st, that a conductor, however well constructed does not infallibly protect a space of sixty feet radius,—2d, that a flash of lightning may strike a conductor, and other adjacent objects at the same instant. The occurrence at Dr Goodeve's house has nothing to do with the discussion regarding the "*lateral discharge*," and had the accident never taken place, the arguments I advance would not be in the least degree affected. One good result, at all events, will proceed from this mistake—that I shall never again depend on the measurements made by persons who do not understand the object in view, and the necessity for care in their performance of so simple a task.

W. B. O'SHAUGHNESSY

Calcutta, 10th September, 1840

JOURNAL

OF THE

ASIATIC SOCIETY.

Points in the History of the Greek, and Indo-Scythian Kings in Bactria, Cabul, and India, as illustrated by decyphering the ancient legends on their coins By CHRISTIAN LASSEN, Bonn, 1838.¹

With Mithra, it appears, was connected a very peculiar polytheism, which had utterly departed from the spirit of the unfigured worship of light, as taught by the original and true Magi; it also appears, that Mithra himself was considered in this worship as the solar god, Helios, as the *Sol Invictus* of the Roman inscriptions of later periods, and that a number of deified beings are grouped around him, produced by the same combination of the religious elements of Asia Minor and of Iran. This religion was more congenial to the Parthians than the purer form of Magism. When under Arsaces vi, they conquered the sanctuary in Elymais, where the goddess Nanea was adored, and when they appropriated to themselves its treasures, they may have probably admitted the worship of this goddess under the name there used.* The Indo-Scythians, when in the time of Arsaces vii, and viii, about the year 130 B.C. they roamed and plundered throughout the Parthian empire, found this worship already established, and a horde of the same people maintaining themselves for some ages in a remote corner of the Parthian empire, made it as entirely their own,

¹ Continued from p 378 vol ix.

* Strabo xvi p. 744 Vaillant Arsac. imp. p 41

as if it had originated with them. It must have been the same horde of this people of Nomades, which was ruled by the dynasty bearing the name *Kanerkis*, as the coins of the *Kanerkis* alone, not those of Kadphises and Azes, exhibit the gods of this system

Without as yet undertaking to determine chronologically the era of the *Kanerkis* and *Oærkis*, I shall now content myself with collecting facts from the fragments of the language upon the coins, to apply them hereafter to history. Now as to this, Mr. Mueller has pointed out, with great minuteness and perfect correctness, as appears to me, two principal elements, included in the system of gods upon the *Kanerkis* coins; deified beings, according to the doctrine of Ahuramazda, of Ormuzd; and, secondly, those taken from the religious belief of the countries of Asia Minor, viz. of Mithra, of Nanaia, and of the Persian Diana. This supposition is countenanced by the names of gods, which, as far as their interpretation is corroborated, are not derived from the countries of India, but from those of Iran.

I shall review the names of these gods, with regard to their derivation, and in effecting this, it will be my principal object to ascertain, whether Indian names be discovered among them, as the consequence of this would be, that the Pantheon of the Indo-Scythians received some additions on the banks of the Indus

My whole task is here so beautifully prepared by Messrs. Prinsep* and Mueller, that I cannot do better than present their inquiries in a form, which assimilates with those of my own.

The gods are the following—

I. Mithra A figure in the dress of the east, with flowing robe, the head surrounded with a circular nimbus of pointed rays, extending the right arm, and supporting the left on the hip, or leaning on a spear. M. 229.

Upon the coins, on the face of which *Kanerkis* is styled βασιλεύς, we observe ΗΑΙΟΣ; and ΜΙΘΡΟ where he is styled PAO-KANHPKI; MIPO appears exclusively to be-

* Especially iv p 629, &c

long to those coins where the name is already corrupted to OOHPKI. Mueller p. 236.

The original form in Zend is *Mithra*, to which the *Μιθρα* of the names of the Cappadocian months corresponds · hence is produced *Mihir* in Pazend, and *Mihir* (مهیر) in modern Persia, which forms are connected with the Cappadocian forms *Minpav* (pronounced *Muran*) and *Muap* in a more corrupted form. In the same manner *MIΘPO* upon the *Kanerkı* coins is transformed into *MIIPO*, which latter must probably be pronounced *Mihiro*. (v. Mueller at the same place.)

I beg only to add, that *Mitra*, though in Sanscrit likewise denoting *Sun*, is merely one name of the sun among many others, nor is it distinguished in a way, that it can have given rise to this peculiar name of the supreme *Hehos*. *Mihira* also denotes *sun* in Sanscrit, and though this cannot be corruptly altered from *Mitra*, yet it is to be derived from a Sanscrit root, as grammatists do. But it must depend wholly upon the fact being carefully ascertained, that *Mihira* was not only used in modern writings, but also in the Vedas to denote *sun*, whether we can approve of this derivation, or we have to bring back this word, together with the worship of the Indo-Scythians to India, after its corruption in the countries of Iran from *Mithra* to *Mihira*.

II. MAO, the moon. A youth in the dress of the East, similar to the dress of Phrygia, with flowing robe, a kind of turban on the head, with a large half moon behind his shoulders, such as the *Deus Lunus* bears upon coins of Asia Minor, the situation in the whole, the same with *Mithras*. (v. Mueller at the same place.)

Mao is the nominative of the Zend form of *mās*, the word indeed is likewise Sanscrit, as it is a common word of all the Asian languages, denoting the moon as a measure for time; the root is *mā*, (measure) but the Sanscrit nominative is *mās*. The forms *Mav*, *Mnv*, are only various off-shoots of the same root. The genitive *MANAO*, shortly to be alluded to, which presupposes the root *MAN*, appears to warrant, that the lunar god in the form he is possessed of upon our coins, was received from the West. But here may likewise be admitted the interpreta-

tion, that MANAO is to express the Zend genetive *māonhō*. In this case *a* would have been substituted for *h*, which letter could not be expressed in the Greek language, while *do*, the *o* of which, together with the succeeding *nh*, takes its origin in the *s* of an older form, probably was no real diphthong; but both *o* and *nh* together seem to express the nasal pronunciation, which precedes *h* in this position; the vowel *ā*, as that of the root, was therefore alone expressed in the Greek orthography.

III. MANAO BAFO, obviously a deified being, related to *Mao*, a large moon-like sickle therefore also appears with him behind the shoulders; he has four arms, leaning one arm on the hip, and holding symbols, not to be made out, with the three others, he is in a kind of Turkish dress, with large trowsers, seated on a spacious throne. (v. Mueller at the same place, p. 236.)

Mr Prinsep has explained BAFO by *baga* (Sanskrit) *splendour*, the word besides denotes, *beauty, glory, omnipotence*, and *Bhagavat*, is a name of Vishnu, as also a frequent epithet of gods. At the same time it belongs to the Zend, and even to the old Persian language, and on carefully examining the meaning of the word in them, it becomes evident, how this peculiar god of the moon is to be understood upon the coins. The four arms perhaps intimate Indian influence.

IV. *Anantis*, NANAIA, NANA, strangely also called NANA PAO, a female figure, dressed in long folded drapery, having a nimbus without rays, and a tiara with flowing ribands, with the right hand holding a branch, or something similar. (v. Mueller at the same place.)*

The Persian *Artemis* has been long ago recognised in this goddess, the worship of whom Artaxerxes Mnemon endeavoured to spread over all Persia, especially in Bactria, and it agrees with this supposition, that this *Artemis*, as Mr. Raoul Rochette has proved it, appears upon the Agathokles-coins as *Artemis Hecate*, bearing a torch, and triple-formed according to the phases of the moon. The word could hardly have originated in Iran, and certainly not in India; it is a goddess of the moon, and the grammatical form of the word is likewise feminine;

* As Trans pl III No 4 pl. xxxvi. No 4

so that the form PAO, by her name, seems to violate the rules of grammar.

V. *Athro*, AΘPO, an old man, bearded, clothed in a tunic, with a wide flowing robe, with the extended right hand (at least on many coins) holding a wreath tied to a long riband. The upper part of the figure is surrounded with flames, which leave no doubt, that here a genius of fire is represented, (v. Mueller at the same place). To Mr Prinsep is due the well founded interpretation by the Zend word *ātars*. The word is here, however, transmitted from the grave declination *ātars* into the soft one *ath(a)ra*, (nom. *athro*) In Sanscrit (of the classic period at least) the word *atar* does not occur in the sense of fire

VI OKPO. This word is usually met with near a figure, the lower parts of the person clothed, with the left hand holding a trident, and the right a snare, and leaning upon an Indian ox Mr. Mueller reminds us, that this position is similar to the figure of Siva and his bullock, Nandi, upon the Kadphuses-coins. The same name is also ascribed to a figure, standing opposite to Nana,* having a light dress, four arms, and the head surrounded with a circular nimbus without rays

Mr. Prinsep has proposed to explain the word by *arka* (in Sanscrit, sun), this is doubtful, for besides that we have already the sun, Mr Mueller very properly reminds us, that all the names, authentically explained, lead to a Zendic origin, likewise the reason for the transposition of *rk* to *kr* is not evident.

On the other hand, a Zendic word suited to explain OKPO, is not known, and besides another interpretation is indeed more to the point.

The bullock, and the four arms, call to mind the Indian god Siva, whose name is *Ugra*, the snare ? (*pāza*) also is an attribute of Siva. By the coin, As. T. IV pl LI No. 1, it is still more evident, that Siva is meant, when he as *pazupati*, (lord of animals) has an antelope with him. As to what Siva had to do with this system, might be differently interpreted; leaving, however, this to the mythologists, we would only add, that

whenever Nana and Okro are placed opposite each to the other, Siva in this case is obviously interpreted in accordance with the character of Mithra. For the Indian Siva has the goddess of the moon only as attributive, usually as a moon-formed sickle over his head, here however stands the goddess of the moon opposite to him as his wife, as if she were understood as metamorphosed into *Parvati*, moreover Parvati has a strong resemblance to Artemis Hecate.

If this interpretation of *Okro* be well founded, (and so it must be by reason of the bullock *Nandi* upon the coins, As. Trans. iv. Pl. xxxviii Nos 4, 5), an Indian element appears in the Indo-Scythian system, which as first annexed to it on the banks of the Indus, may be easily explained by the Siva worship upon the Kadphises-coins

Okro as well as *Athro* point out a dialect, which allowed of no literal absorptions, and therefore was different from that exhibited in the native legends.

VII. OΔΔO, As. Trans. iv. pl. LI. No. 8 A youth with a crown of glory, and a light dress. He holds, as he runs, with both hands, a wide robe, which falling down in large circular lines, surrounds the figure. (Mueller.)

The name is as yet unexplained, I propose *vādō*, that is *wind*, (in Zend *vātō*, modern Persian *bād*.) In Sanscrit too, *vātā* denotes *wind*, *the god of wind*, more frequently *vāyu*. As the wind is also worshipped in Zendavesta, and even as *vāto*, this element of Scythian mythology perhaps belongs to Iran. The running alludes to the wind —

VIII (A) PΔHΘPO, upon the coins of *Kodes*, As. Trans. iv. pl. xxv. No. 11, 12, and No. 13. A standing male figure, dressed in a tunic, with the left hand leaning on a spear, the right resting on the hip, flames round the shoulders, and a head dress, the shape of it indistinct. It stands there PΔHOPOY-MAKAP, which Mr Prinsep* has acutely altered into APΔH-

* Mr Prinsep observes, v p 643, that some copper coins have OPOOK-PO, and would explain it by *Arjarka*. According to my supposition, OPΘOKPO approaches more nearly Indian orthography. The figure on a very large and rough kind of coins, (see iv Pl. L.) which is called the

ΘΡΟΥ ΜΑΚΑΡΟΣ In the same relation as ΑΡΔΗΟΡΟ stands to ΑΕΡΟ, does.

IX ΑΡΔΟΚΡΟ or ΑΡΔΟΧΡΟ to ΟΚΡΟ. The figure of *Ordokro*, however, is very different from that of *Okro*. *Ardokro* is represented as a woman in long clothes, with a circular nimbus round the head, in the hands a large cornucopia, usually in a standing position, but upon later coins, sitting on a throne, with the feet on a footstool (Mueller). Mr Prinsep has proposed the very plausible interpretation, that the prefixed syllable ΑΡΔ might be the old Persian *Arta* in Artaxerxes, the Pehlivee *ard* in Ardeschir, and in similar names, therefore *venerable, holy*. But I strongly hesitate. How can *Ardokro* have a male termination, and female figure? Then *Okro*, substituted for *arka ardokro* would be a vox hybrida. The same will be objected to *Okro*, when substituted for *Ugra*. This is true, but if *Okro* was properly explained by *Ugra*, another interpretation is offered for *Ardokro*.

Ard perhaps in this case may be *Ardha*, meaning *half*,* and *Ordokro* is *ardhógró* (*half Siva*, i. e. an androgyne Siva) as on the other hand *Ardhanari*, (*half wife*), is likewise used for this figure. This interpretation satisfactorily vindicates the masculine termination with the figure of a goddess.

X ΟΡΑΑΓΝΟ upon a coin of Kanerki, As Trans iv. Pl. xxxvi No. 1, Mr. Prinsep takes it for ΟΡΔΑΓΝΟ, from *ard*, and the Indian *agni*, fire. The coin however, has no symbols of fire,† and the legend gives □ instead of Ν. I shall wait for further information.

XI ΦΑΡΟ. At the same place, No. 2, an ΟΟΗΡΚΙ coin, with the robe, so frequently thrown behind with those figures, extending the right hand, the left supported on a long sceptre, the head surrounded with a circular nimbus, very little different from Mithra himself. (Mueller.)

dancer, refers also to Siva. There seems to be ΟΡΟΟΚΡΟ too, p. 633. We find there the complete type of Siva Tripurántaka, the wild dance of Siva, who throws the giant to the ground. I refer to the representation by Tod, Trans of the R. A. S. 5 p. 11.

* It is a figure armed with spear, sword, helmet and a wide robe.

† V. p. 640

Mr. Prinsep (V. p 640) calls to mind the names Phraates, Phraortes, Phradates. The last especially is very plausible, and Phradates might have been substituted for Pharadates, *Phara* would be the root for *Pharó*. Mithradates and so many similar names are sufficiently known. Phradates cannot, however, be but *fradata*, i e *fra* cannot be but the preposition. I observe in Vendidad Sade, p 50, a word *frá* (bjô), which I, however, cannot explain.

XII Mr Mueller cites, according to the coin, vol. III. Pl. xxv. No 11, another figure of a god, with the legend ΟΔΥΟΒΟΥΛΑΚΑΝΑ; ΑΛΑ, however is uncertain. I have no conjecture to offer whatever, (there is only one figure) on this word.

The word ΜΑΘΡΟ which Mr Prinsep reads on some coins of the king, riding on an elephant (As Trans. III p. 453), perhaps is merely ΜΙΘΡΟ, a little indistinct. Thus we at least observe it upon one of those coins, vol v Pl LI No 10.

I have thus subjected these coins also, as briefly as I possibly could do it, to an examination, with reference to their philological facts. The principal historical fact, resulting from them, that the dynasty of *Kanerkî*, *Oerki*, and of their successors, however they may have been styled, were addicted to a doctrine, which compounded of those of Mithra and Zoroaster, cannot have been produced, but while they passed through Bactria to India, scarcely required so long a discussion, while on the other hand, as regards the religious history, a discussion, much more exact, must be undertaken, as many new materials will probably be supplied from additional coins. The mixture of an Indian ingredient in that mythology derived from the Siva worship, may be considered as a discovery, casually obtained. All these names of gods do not properly fix the native country of the coins, but bear the impress of those countries, in which the gods originated, and not necessarily or exclusively of the region in which the *Kanerkîs* reigned, when the coins were struck by their order. The words of Zend, however, incidentally concur in proving the Zend to have been at that period the language of Bactria, and perhaps of Sogdiana. In a strict sense, PAONANOPAO and KOPANO alone hint at the native country of the coins.

§ 10

Indian, Sassanian, and very ancient Indian coins.

We shall here only touch these two classes as the limits of our investigations, and as points, important for the critical illustration of the former classes. A discovery made by Mr. Prinsep, and fully examined in some treatises by him, gives both classes an unexpected reference to the foregoing ones, viz. that the Indian coins the most ancient we know, have been gradually formed partly out of the different species of *Kanerkī*-coins, partly out of a peculiar class of Sassanian coins *

This latter class scarcely belongs to the well known dynasty of Persia Proper, whose coins are brought for sale to the bazars of Cabool, (As T VI. 289) but a collateral line of the Sassanides must have reigned in Cabul, and Beghram At the latter place a great number of their coins have been discovered. We observe two different kinds of them, to which a numerous division of coins is joined, already entirely Indian, and having Nagari legends. These latter shall here no further occupy us

The first class of the coins, strictly Sassanian, consists of small copper coins, which may be divided, after the head-dresses of their images, into three series · one coin of this class is published by Mr. Masson, As Trans. v. Pl XLIV. The legend appears hardly to be in the characters, known to us. The second class is chiefly distinguished by a buffaloe's head being over the head of the king, and by the fire altar on the reverse. Their legends seem to be a species of the character of Sassanian Pehlvi as found on coins, but they also have Dêvanagari letters, As. Trans VI Pl. xiv. No. 3. No 5 No. 6.

By this they are connected with a class, a few specimens of which are only discovered, two however in Manikyâla. They have the complete Sassanian type, with the exception of the fire altar, with legends in Dêvanagari, As. Trans. III. Pl XXI. p. 439. VI. p. 288 A third of these coins from Cabul (As. Trans. III Pl. xxv. No 6.) distinctly has the name श्रीवासुदेव

* See chiefly As Trans IV p 621, p 668, then vol VI p 288. Specimens of Hindoo coins, descended from the Parthian type, though the word Parthian in the title for Sassanian is not at its right place

Crivásudéva Beside these legends, others in Pehlvi characters are met with. A *Vásudéva* is related by Muhammedan history to have been king of Kanôja about the year 330 A. D.* As Trans iv p. 348. He is perhaps the same, the coin of whom is extant.

The first of the classes, above mentioned, of the Sassanian coins from Kabulistan, proves, that a separate (independent) dynasty of Sassan's descendants have reigned there, the second class proves, that a dynasty, related to it, or the very same, ruled in India itself, perhaps in the Punjaub, (to this conclusion we are led by the Indian characters), and that it gradually gave way to purely Indian kings, for *Vásudéva* is certainly an Indian name.

Mirkhond indeed mentions the name of the king of Cabul, as of an independent king, the daughter of whom the Sassanian Hurmuz, the son of Naisis, married †

I think I still can point out a new kind of coins, referring to this division.

Swinton has already published a coin, which he calls Parthian†. The head of a king is there surrounded by the following Greek legend: ΒΑΣΙΛΕΥΣ ΜΕΓΑΛΟ—, while the reverse has a Roman Victoria, and a legend in a character, which Swinton proposed to read, (upon the pretended similarity with Palmyrian letters), *Padeshane mo(nesh)*, *Emperor Monneses*.

On this *Monneses* as on *Adinnigaus* of which affirmative coins exist, Ekhel arrived at the result, that they were not Parthian,

* This Vasudéva perhaps belonged to the dynasty of the Guptas, which we find in India at the same period with the Sassanides, of whose names Mr Prinsep has already restored a long series according to coins, As Trans v p 536. One of them, Kandragupta, boasts in the second inscription of the column at Allahabad, not long ago authentically published, of having received tributes from the kings of Persia and Saka. The expressions, are very remarkable. **दैवपुत्राद्विषाहानाद्वि** the Shah, born of God, the Shah of Shahs, "which exactly is the title of the Sassanides upon coins and in inscriptions. The proper name is unfortunately not mentioned. As Trans VI p 977.

† De Sacy *Antiquités de la Perse*, p 304.

‡ Philosophical Transactions—vol L Pl i p 115 Pl iv No 1, another coin, which Swinton ascribes to Balogases III (vol XLIX p 593) has also relics of native writing, which however is not distinctly Cabulian.

but Bactrian kings * Mionnet† arranges both under the kings *Characene*, upon the authority of Visconti, who first properly determined the coins of this dynasty, (*I-conographie Grecque* III p. 260 —)

I do not find, that among the acknowledged coins of *Monneses* any one is noted, which has upon the reverse a legend in native characters, and supposing that the *Mo* upon the coin of Swinton supplies *Monneses*, this king was not a native of Charax, but of Cabul, for the native legend obviously is the following .

𐭠𐭣𐭠𐭮𐭠𐭮𐭠𐭮𐭠𐭮𐭠𐭮𐭠𐭮 *viz.* in the ordinary form: 𐭠𐭣𐭠𐭮𐭠𐭮𐭠𐭮𐭠𐭮
(ma)hârâjô rajâ duâjô

The writing has exactly the strokes of the characters in the tops

The head dress of this coin has rather a Parthian than a Sassanian character, as the victory also intimates a Parthian, not a Sassanian dynasty The form of the native character leads us, however, almost down to the age of the Sassanides, and certainly fixes Cabul as the native country of this coin The existence of the Greek writing must, however, prevent us from assigning this coin to a later period than that, when the Greek writing was still in use upon the coins in the countries of Iran The Sassanides never made use of it, as far as I know, upon coins, and with the Kaneiki-coins it fell into disuse in the border countries of India The coin may therefore belong to the period, preceding that of the Sassanides

The type of the coins, which are proved to refer to *Monneses*, is at variance with the supposition, that the king on the coin under discussion was likewise called *Monneses* But as there now is none in the series, known to us, of the Parthian kings, whose name commences with *Mo*, we must be allowed to suppose, as of the Sassanides, so of the Arsakides, a collateral line to have established an independent kingdom on the borders of Kabulistan. But it would be proper to examine, whether the initials preserved of the name rather be not *ME*, in this case *Meherdates* might be conjectured

To return to the real subject of this chapter, I conclude these remarks by observing, that no Indian imitation of the Kadphises-

* Doctr num vel. I vol III p 560 † Tome VIII p 510 v p 706

coins has been hitherto discovered, and I shall pass to the inferences, which may be drawn from the facts adduced.

First —The Kanerkī dynasty have probably survived all the others of foreign origin, the Sassanides excepted, as the coins of the Kanerkis gradually slide into Indian types, which those of the others do not do.

Secondly —The use of the native writing did not cease with the downfall of the Kadphises-dynasty, for it still exists upon the topes, which entomb coins of the Sassanides as well as of the Kadphises and Kanerkis, and the coins of the Sassanides are besides of a more recent form, than that used on the coins of Agathokles. The Pehlvi character under the Sassanides, the Cabulian character on the topes, and a form of Devanagari, much approaching to the modern one, existed therefore together.

Thirdly.—The types of the Kanerkī-coins in the last period exhibit such a great decay of the art of die-cutting, such a total oblivion of all traditional remembrances of Greek art, that we must on this account too conclude this dynasty to be the last before the Sassanides. The Sassanides moreover had a different religion. But we will not dilate too much on these inferences; for as we do not know when the Sassanides settled themselves in Western India, we cannot dispute that the Kanerkis may have held out for a long time in the time of the Sassanides. Nor is it allowed from the extinction of the native characters upon the coins of the Kanerkis and from its existence upon those of Kadaphes and Yndopherres to infer, that the Kanerkis universally and simultaneously supplanted the Kadphises; for the very existence of the coins upon the topes in which Kanerkī-coins were already enclosed, proves that the writing, as being on the coins, was still in use when Kanerkī-coins were already struck; it proves, that there were other reasons for not adopting that writing upon the coins, than the abrogation of the characters of the legends; or, in other words, the coins do not prove that the Kadphises did not reign at the same time with the first Kanerkis. But it will be more advisable to look, if possible, for some other, and better defined leading points, before attempting to set ourselves right in this field of speculation, confused as it is by the entanglement of dynasties.

SECOND PART.

APPLICATIONS TO HISTORY

§ 11

Geographical points

We shall now attempt to comprehend under some more general points of view, the materials, obtained by independent inquiries, applied detachedly to different subjects. We may perhaps thus succeed in grouping these single facts into classes properly arranged

The results of inquiry separate themselves into three divisions, being partly paleographic, and partly philological, from both which (together with those results which the numismatological examination will bring to light,) follows a series of historic facts, which are to be compared, and brought in accordance with the relics of written history, as it is delivered to us

From the foregoing inquiry it has been proved on the whole, I hope, that the countries, in eliciting the history of which these ancient coins have unexpectedly presented themselves as a novel documentary agency, are the western boundaries of India. The coins have been partly discovered in western India, especially in the Pentapotamia (Punjab); and the tope of Manikyâla, between the Indus and Hydaspes, has been a principal source of discovery, though it is only one among a number of many others on a smaller scale. They are also found in the regions along the Cabul river, and especially abound in the ruins of Beghram, a town at the southern entrance into the Indian Caucasus, situated if not exactly, yet very near the place where Alexandria ad Caucasum was founded. The whole course of that river, however, is a mine of coins, and the favourite site of the topes, coeval with and witnesses to that period, to which the more recent half of our coins, not the work of Grecian kings, appertains.

Though the more eastern part of India, viz the (Doab) land between the Zatadru and the Jumna, as well as the country

in the north from the Indian Caucasus to Bactria, have contributed their share to our treasures, yet they have done it only in an inferior degree. Now if the place of discovery of coins may point out the country in which they originated, the Punjab and Cabul are those to which must belong most of the names of kings we have examined. It is therefore necessary more carefully to set ourselves right as to the geography of those countries, with regard to Bactria, and the other parts of India; as regards this, however, the general information possessed by our readers will be amply sufficient. Without extending this geographical inquiry, we may be allowed to refer, as respects the Punjab, to a published work* which indeed now requires some additions and corrections, but which yet contains all the statements, most important for our purpose.

With respect, however, to the countries about the Cabul river, where the boundaries of Indian and Iranian alphabets, languages and nationalities are fixed, where the empires to which we have to assign their situations come most closely in contact, and seem to intrude one into the place of the other, and for the historic geography of which, there exist sources not fully consulted, as regards those countries, it appears to be indispensable to attempt an independent inquiry, with constant reference to the points to be discussed in the course of examination.

As between Hindoostan and the highlands of Tibet, the Himaleh, properly so called, is the wall of separation, so is the western continuation of the same mountain range between the countries belonging to the Cabul river, and Bactria; we may call this western branch the Indian Caucasus or Hindookush. From the point where the Indus, descending from the north, breaks through this mountain range, it first runs, in about the 36th degree of north latitude to the meridian of Jelalabad; the western extremity of this circle nearly coincides with the 35th degree of north latitude. These mountains, viewed from the southern low land, appear as a four-fold chain of towering hills,†

* De Pentapotamia Indica commentatio geographica atque historica Bonae, 1827, 4to

† Elphinstone, an account of Cabul, 1 p 154, 2 edit

the fourth range of which being the highest and nearest to the north, rises to the level of eternal snow, and has at least partly an elevation of 20,000 feet.

The Hindookush further runs from the point presently described north-west, and then westerly, till it attains its culmination with the elevated snow-clad peak, properly denominated the Hindookush. The mountains then gradually descend towards the west, assuming the name Paropamisus, while the higher range, turning south-south-westerly, rises again in the Kohi-Baba to a high snowy pinnacle. Under this lies on the westerly side, Bamian, which therefore has a northerly, and not a southerly aspect, this is the discovery of Burnes.

These vast mountains, the Indian Caucasus in its most extensive sense, from the point where the Indus breaks through them to Kohi-Baba, are the northern boundaries of the countries about the Cabul river. From this range most of the tributaries of the Cabul river descend, and it gives the country its prominent features. We must look at it therefore more closely.

At the western extremities of the first eastern half of the Indian Caucasus, a high tract of mountains stretches down to the valley of the Cabul river, its southern extremity from the northern bank is thrown opposite to the Sefidkoh, (in the Afghan language *Spin Gur*), viz white mountain, which rises on the southern bank of the river, this southern end is the high snow-clad peak, Kooner, very nearly approaching to the valley of the river. We shall give this transversal range the name of the Kanda mountains, as they were probably called so in the native language. The whole of the countries about the Cabul river are equally divided by them into regions of a totally different character, the western and the eastern.

To know the boundaries of the country under consideration, we must recur to Kohi-Baba. Hence extends a high mountain tract to the south. Though no remarkable hills, no table heights are mentioned as existing among them, yet the course of the streams would range in their favour. The Hilmund and Urghandab descend from that mountain tract in a southern direction to the basin of the Zareh; the Ghazna runs to the north-eastward, and joins the Cabul river, flowing to the south-east.

South-westward from Cabul there lie, says Sultan Baber,* “high snow-clad mountains, and the Bamian chain (Kohi-Baba) is of an extreme height. The Hirmand, the Sind,† the Doghabeh, Kunduz, and the Balkh rivers all rise at their culminating point, and one may, it is said, drink on the same day out of the sources of all these rivers.”

These are the natural boundaries of the countries of Cabul towards the west.

From the mountain tract, where Ghuznee lies southward from Cabul, to the Sefidkoh, already mentioned (which may be considered as the most northern branch of the Soliman mountains, running from the north towards south) the valley of the Cabul river is bordered by hills of less height and regularity. They have not received any general name, and but small bodies of water descend from them, as they are not high enough to be continually covered with snow.

Looking again from the Sefidkoh to the point projected from the south of the Kanda mountains, we have the confines of the western half of the Cabul countries. The valley of the river, narrowed by the Sefidkoh and Kooner, appears like a rocky gate between the west and the east of the countries through which the river forces its way, over cliffs and down rapids, while from Sefidkoh the Tira chain of hills with its ramifications extend eastward to the Indus. The Salt range, so called, commencing from the same point, runs south-easterly to the same river, which it reaches at Karabag, the Tira chain rises from the south over the plains of the Cabul river.

Thus once more gaining the Indus, we have compassed the whole extent of the Cabul countries, the natural boundary of which towards the east is that river.

The eastern half of these lands may be called the *inner*, as may the western half, the *outer* boundary of India.

To understand the articulation of each of these boundaries, we must look closely to the rivers.

The Cabul river, which rises at the foot of the Kohi-Baba,

* Memoir, p 282, German translation

† A mistake, it must be the Cabul or Gurbund.

and flowing from Cabul itself in an almost direct line, joins the Indus at Attok, forms as it were the bond, by which the various members of these geographical divisions are connected, and proves their inseparable unity

From the high mountains to the north there run to the banks of the Cabul river many streams in valleys, which are either distinct, or connected with others, each of these valleys, and in an inferior degree every lateral valley, forms an independent district, and hence the various articulation of the whole

With regard to these valleys, which we may call after their rivers, all the streams having the most easterly direction, viz. the Abbasin, which is furthest east, and the Burrindu, a little more to the west, flow into the upper Indus, without passing through the Cabul districts

More to the westward rises the Sewad, into the valley of which river that of the Penjhora runs from the west, while the Bagar from the south-eastern declivity of the Kanda mountains joins the united Sewad and Penjhora. In the latest map (by Burnies) the three united rivers are called Lundye, which having passed Hashnagara, disembogues into the Cabul river.

These valleys, descending in terraces towards the Cabul and the Indus, form the mountainous country of the inner boundary of India to the north-west, to which also belongs the plain above the valleys on the banks of the river, as well as the northern declivity of the Tira chain, before mentioned. The plain is hot low land, already manifesting a completely Indian character; Peshawur in the centre of this plain is situated on the banks of the river. The northern districts of the valley form landscapes of a genuinely Alpine character, adorned with all the luxuriant beauty of an almost tropical mountainous country.

Now between the eastern and western extent of the Cabul country lie the Kanda mountains, with the Sefidkoh as a high wall of separation, which cannot be appropriated to either of those districts. From the central point, whence it spreads its ramifications from the Hindookush to the southward, another high elevation rises, the Belut Tag, which extends in a circle NNE to the Mustag, and forms, as it were, the northern

continuation of the Kanda range. From its north-eastern extremity, the Pushtigui, a river now called Kameh, gushes rapidly southwards, and forces its way between the Cooner and the Nurgil in the Cabul valley, almost opposite to Jelalabad. This narrow and almost impervious valley rises like a long narrow gateway in a northerly direction ; on the north side of the Pushtigur the streams already flow to the Oxus. The Kameh valley supplies but few accommodations for trade with the north, it is little accessible from the plain of the Cabul, it is rather a wall of separation to the east and the west of the whole country along the river.

From Sefidkoh a valley of a more remarkable character opens towards the Cabul river, through which the Soorkhrood, ("the red river,") flows.

Just above Jelalabad the boundaries between the warm low lands of the east and the cooler highlands of the west, are determined ; this little district of Jelalabad, on the river Cabul and the stream formed by the junction of the Kameh, and the Soorkhrood, may represent the gate, through which we enter the outer boundary of India.

Cabul lies almost in the centre of this boundary, and is at least in a historical and political point of view, the centre point of the country. In her neighbourhood, rivers from the south-west, the west, the north-west, and north, unite and form the main river, which has obtained the name of the town. At this spot open the great roads, whether for peace or for war, between Iran and Turan on the one hand, and India on the other. It is a situation, possessed of inexhaustible importance, as the whole history of southern Asia bears witness.

Looking on the subject in detail, we find, that due west of the lofty Kanda hills the valley Laghman splits in two, forming those of Alishung and Alingar, and opens towards the Cabul river.* More to the west the valley of Tugow is traversed by a river of the same name, not far below the disemboing of the Panjhr. This river takes three united streams into the Cabul, namely, itself, the Gurbend, and the Nyrow, which

* Elphinstone, 1 160

all descend from the Hindookush through main valleys, in which less considerable bodies of water are discharged, giving the effect of the fibrous ramification of a leaf in the union of these river valleys. The Gurbend, rising in the western range of the Hindookush, flows to the east, the Panjhir from north to south, while the Nijrow runs in a south-western direction to the Panjhir. The district above the junction of the three rivers, is called the Kohistan, the highlands of Cabul, a beautiful Alpine country, not inferior to that of Penjhora, and Sewad; below that junction extends the more even country of Kohdaman, "the skirt of the mountain." This variously ramified system of valleys includes the passes, which lead from Cabul itself, over lofty mountains, winding upwards through their valleys in ramifications, either westward to Bamian under the Kohi-Baba, or northward over the Hindookush, to Anderab and the higher north. There are altogether seven or eight of these

On the southern boundaries of this western district of the Cabul we have to notice the valley of the river Ghuznee,* which leads to the town of the same name, lying on a rugged lofty plain, the ancient seat of mighty dominion.

Hence goes the road to the river valleys of Arachosia, descending westwards.

The plain of the valley of the Cabul river, before it reaches Jelalabad, lies in a situation so much higher than that of the lower part of the river, that the climate and products are as different from those of Peshawur, as are the products of loftily placed, and frigid Ghuznee from those of Cabul

As the outer boundary constitutes a gradual approach to the inner one, so is it in relation to India Proper. Cabul is one of the most beautiful countries of the earth, highly praised by Sultan Baber, warm in virtue of its southern situation, and the protection afforded by the mountains towards the north, and at the same time cooled by reason of its height above the level of the sea.

This very succinct description was specially intended to call to mind the following facts.

First.—That the natural road to India passes through western Cabulistan, whether we start from Arachosia, from Aria (Herat)

or from Bactria, the paths from the northern and central Asia meet here.

Secondly.—It must not be forgotten, that the districts along the Cabul river have a tendency to resolve themselves into petty states and national confederacies, unless a vigorous hand sways the sceptre within the country. The country does not only separate of itself into an eastern and western division, but, if circumstances admit, small independent powers may also maintain themselves in the valleys of the northern tributaries of the main river.

Thirdly.—Supposing such a state of disorganization to exist, each of these little river districts will seek its centre in itself, and create a petty capital. However, in a state of well ordered union, some particular *foci* of intercourse along the course of the main-road, about Peshawur for the eastern, and Cabul for the western Cabulistan, about Jelalabad, as connecting both, and for intercourse with the Kameh valley—lastly, at the entrance into the passes over the Hindookush on the low lands round Beghram—must be formed by the course of mercantile transactions. To render these relations quite evident, we may observe, that the peculiar architectural monuments of the country, the topes, are grouped round those four mentioned places, Peshawur in the valleys of the Khyber tribes, Jelalabad at Soorkhrood, Cabul itself, and, lastly, at the foot of the mountain district round Beghram.

For the purpose of giving a sketch of the historical accounts of this country, we may commence by observing, that we must especially keep in view accounts as to the national characteristics of those people, without engaging in a complete inquiry into the passages of the ancient geographers. We shall postpone this to a more appropriate place, and besides, there exists already a very thorough examination of this kind by an eminent geographer.*

By way of beginning on a safe basis, let us commence with the celebrated campaign of Alexander the Great.

* Carl Rutter on the campaign of Alexander the Great in the Indian Caucasus (in den Abhandlungen der Berliner Akademie aus dem Jahre 1829, p. 137)

He found these countries and nations in the state which must have subsisted during the whole period of the Achæmenides; for the rulers of Persepolis in succession to Darius, the son of Hystapes, who perhaps exercised a more vigorous authority, were satisfied with the attendance of those remote nations in the field on occasion of war, and with the regular transmission of tribute, they did not disturb the tribes in their national customs and institutions, though they were powerful enough to check the violent inroads of the northern hordes, by whose success national characteristics were afterwards introduced of a totally novel description.

When Alexander after having subdued the Drangges and Arachosians set out for Bactria, he encountered Indians for the first time * Having subdued them, he reaches the Caucasus, and founded on its skirt an Alexandria, the situation of which, according to the careful examinations of Mr Masson† must be most probably looked for near Beghram. The Indians above alluded to, therefore inhabited the highlands, which separate the streams running to the Helmund, from the tributaries of the Cabul. Strabo calls those Indians *Paropamisades*, but uses, however, as he often does, an inaccurate term, when he states, that Alexander had penetrated to the Arachosians through the *Paropamisades* ‡ The passage through their country during the winter season was difficult on account of the large quantity of snow, but it abounded with villages and provisions for the army, it was the highland westwards from Cabul

We again follow the march of Alexander, when returning to Alexandria Sub-Caucaso, he passes for the second time the Hindookush, the town is then called Alexandria in *Paropamisades*.§ These Indians are therefore obviously called by a peculiar name, after the mountains, viz. *Paropamisades*, the name of the mountains which they inhabited, being partly *Paropamisus*,|| and partly Caucasus, and this name refers as well to

* Arr III 28

† As T V p 6

‡ XV Ariana, § 10

§ Arr IV 22

|| Ptolemy, more correctly *Paropanisus*, it is the country under the mountains, which are called *Nishada* in Indian geography That the ancient geographers have assigned the name *Paropamisus* to the more western mountains, we are not authorized to assert —(Lassen)

the Hindookush itself, as to its western parts, the Kohi-Baba, and the lower ranges, which at the lower extremity are protended in a westerly direction. With the nation of the Paropamisades must also be numbered those tribes, who inhabit the valleys of the northern tributaries of the Cabul, viz. of the Gurbend, Panjhir, and Nijrow; for Alexander formed a new Satrapy out of the districts of the Paropamisades, καὶ τῆς ἄλλης (χώρας) ἐς τε ἐς τὸν Κωφῆνα ποταμόν.

The Kophen is not,* however, as might be supposed, the Panjhir, with his two tributaries, for by starting from Alexandria, which upon this conjecture must have been situated at the Kophen, one would come first to this river; we find in Pliny† “ab ea (Alexandria) ad flumen Copheta, et oppidum Indorum *Peucolaitin* cccxxvii” Whether Peucolaitis be correct here or not, is besides the question. The Kophen evidently is, we may say, the united Ghuznee and Cabul rivers, and the Satrapy of the Paropamisades is the Kohistan and Kohdânan of the present geography of Cabul, together with the mountain vallies on their western boundaries.

Till the arrival of Alexander at the river Choes, Arrian (vi. 23) uses no other names (than the above); the intermediate country to the junction of the Choes (Kameh) with the Cabul, may therefore have belonged to the Satrapy, not the nation, of the Paropamisades‡

Strabo§ says, “near the Indus there are the Paropamisades, above the heads of whom the mountain Paropamisus rises.”

* Arr III 22

† VI 21

‡ Pliny vi 23 ‘says’ “some authors still add to India the four Satrapies, Gedrosia, Arachosia, the Arians, and Paropamisades ‘ultimo fine Cophete fluvi’ Is now the Cophen the extreme boundary of India with the addition of the Paropamisades? This would be an absurdity, and Pliny does not recollect, that by adding the Paropamisades to India, he had not to describe the remotest confines of the Paropamisades toward India, but the boundary of India, enlarged towards the west. He has therefore retained the boundary of the Alexandrian Satrapy of the Paropamisades, at the same time, that he gave it up. The reason upon which those Satrapies were numbered with India, was an incidental one, viz the cession to Sandrokyptos by Seleucus Nicator

§ I 1 § 9

But this is to be accounted for by a similar negligence in expression, as Strabo sometimes commits. He afterwards places certain nations between the Paropamisades and the Indus, which is a striking contradiction.

The following statement of Strabo is of far greater importance. According to him, the whole country between the Indian sea in the south, and the Paropamisus and Caucasus on the north, the Indus in the east, and Karmania, Persia, and Media, in the west, is an immense square, which is comprehended under the general name Ariana, the Gedrosians, Arachosians, Paropamisades, in parallel layers are superimposed one on another. We shall not dispute the systematical regularity of this view, in favour of which the Paropamisades are extended to the Indus. Ptolemy, who distributes in the same manner these nations, and defines more correctly the boundaries of the Paropamisades, does not use this general term, nor does it occur in the narratives of Macedonian history. Strabo has perhaps got it from the Parthian and Bactrian history by Apollodoros. It is true, he says, that the name Ariana likewise refers to some tribes of the Persians, Medians, Sogdians, and Bactrians, or, (to apply here our modern information), that the ancient name Aarja of the Arians, was also in use with the four principal nations of Iran, before mentioned, but he distinctly places between the western and northern Iran, properly thus called, and India lying more to east, his Ariana, as a separate division, as an intermediate country, in which the nationalities balanced towards both directions, and were neither of a marked Indian nor Iranian character. But more precise investigation would certainly prove, that his view, concerning such a great nation, forming a transition from the Persians to the Indians, though it generally were correct, still must be defined more correctly in various points of view, to bear upon the different divisions (of that nation). The Airjana of the Zenda vesta, however like in name, has certainly nothing in common with this Ariana, though many be pleased to confound them.

We must hereafter take up again the thread of the inquiry, what situation between the Indians and Persians the Paropamisades have occupied ?

Alexander, after having arrived at the Choes (Kameh) commences on the western bank of the Indus his campaign against the nations, in a strict sense here already called Indians. They are named by Arrian, numbering them from west to east, Aspasiens, Guraei, and Assacani * Strabo styles the nation, first mentioned, Hippasians,† and substitutes for the Choes the Choaspes, which disembogues into the Kophen (§ 26) and which therefore cannot be, as it occurs upon the map of Ritter, another name for the Kophen. Aspa is a term, alluding to Persian language, and Choaspes (qazpa) is the river of beautiful horses, there is an evident reference of the nation with the river, and they probably lived on its banks. Alexander first marched upwards to the Choes. Πορευθεὶς δὲ παρὰ τὸν Χόην καλούμενον ποταμὸν ὀρεινὴν τε ὁδὸν καὶ τραχεῖαν, καὶ τοῦτον διαβάς χαλεπῶς, κ. τ. λ.

He reduces there two towns, the second of which was called Andaka, he then proceeds to the river Euaspla. Καὶ διελθὼν πολλὴν ὁδὸν, δευτέρῳσι ἀφίκετο πρὸς τὴν πόλιν.

After having taken this, he passes over the mountains to Arigaeum.‡ I must here depart in view from our celebrated geographer Mr. Ritter, who thinks Euaspla to be the Choes, but it must be a tributary of the Choes which Alexander touched, διελθὼν πολλὴν ὁδὸν, and after he had already marched into the Kameh valley. Alexander first left this lateral valley of the Kameh, when setting out for Arigaeum. Euaspla now is partly a Greek translation, (εὐ-ασπλα perhaps εὐ-ασπης) of Choaspes (hu,guṭ Sanscrit svhazpa-quzpa).

Strabo by taking the Choaspes for the Choes, viz the smaller for the larger river, has confounded both of them, while Arrian separately mentions them. Choaspes, or Euaspla, probably is the Seesha upon Mr. Elphinstone's map.§

* IV 23

† XV § 17 § 27

‡ Arr IV 24

§ I am under the necessity here also to contradict the excellent historian of Alexander the Great, Mr. Droysen. The point at issue is especially the following passage of Strabo, § 26 Ἀλέξανδρος—ἐπέστρεψεν—καὶ τὸν Κώφην ποταμὸν καὶ τὸν Χοάσπην, ὃς εἰς τὸν

The Aspasians probably are the same with the Azvazeelas of the ancient Indian geography, who are neighbours of the Kambôjas, fighting on horseback.

The Guraans are the inhabitants of the valley at the river Guraeus, (Arr iv, 25) the Penjkora, into the valley of which Alexander descended near Arigaeum ; the Guraeus, according to Arrian, retains this name to its disemboing into the Cabul, while Ptolemy only mentions the Sewad, the Suastus Gorydale was probably situated just at its very disemboing

The Assacamans in their towns Massaga and Ora had their abode between the Guraeus and the Indus.* From them there are distinguished the Astacianians, who are no doubt justly taken for the subjects of Astes, the ruler of Peucala, the district on both banks of the Indus, above the disemboing of the Kophen † According to Ptolemy, the Gandarians inhabit this country, who live therefore on the northern bank of the Kophen, while Strabo relates of the Gandartitis, living on both bank of the Kophen, he follows here the native view, according to which Gandhara denotes the country from Peshawur to the Indus.

The Massianians, mentioned by Strabo, are too insignificant to be inquired into, and we shall leave it to others to deal with

Κώφην ἐμβάλλει ποταμὸν, καὶ κατὰ Πληγήριον πόλιν ῥυεῖς παρὰ Γωρυδάλην πόλιν, καὶ διεξὼν τὴν τε Βανδοβηνὴν καὶ τὴν Γανδαρίτιν.

Mr Droysen says (history of Alex p 376) we need only to omit καὶ preceding Πληγήριον to find every thing correct Now if the sense, not the syntax alone must be in accordance, ὅς and ῥυεῖς and διεξὼν would be referred in this case to the Choaspes, disemboing upon this conjecture through the Gandartitis into the Indus, i e the Choaspes would do what is due to the Kophen, which Strabo himself mentions as the main river There consequently is also a confusion in the views of Strabo, an unprecise understanding of the reports, and the words following ἐμβάλλει ποταμὸν are indeed to be referred to the Kophen Hence it follows, that Plegierum, Gorydale are towns, and that the districts Bando bene and Gandartitis to the disemboing of the Kophen into the Indus successively are met with

* Arr. IV 26 Ind I Strabo, XV § 27

† Droysen, history of Alex p. 374

the fabulous Nysaeans. We have mentioned every important fact for our purpose by adding, that Alexander did not touch the southern bank of the Kophen, since he was informed, that it was not fertile, as the beautiful land of Alps in the north.* We therefore meet between the Paropamisades and the Indus a series of independent, warlike mountaineers, under their chieftains, separated into many smaller tribes, rich in flocks and herds, they are always called Indians, though no mention is made of either institutions characteristic of India, nor of Brahmins. This is doubtless correct; for they were inhabitants of the Indian frontier, not exactly regulated by Indian customs, outcasts of the soldier caste, as Indians might term them.

As mention has been made of the Gandarians, we are allowed to combine these accounts with those, long before given by Herodotus. The Gandarians he mentions, must be the same with those now under consideration. Darius also enumerates them among the number of the nations under his sway. Herodotus does not mention the general name of the Paropamisades, but only single tribes, among whom the Sattagydes perhaps belong to the Paropamisades of a later period †

In these accounts the national discrepancies between eastern and western Cabulistan appears most evident, the western half belonging to the Paropamisades, the eastern to India

Ptolemy's accounts are contemporaneous with a period referred to in some of the coins; the additional value his information thus acquires, is enhanced by constant perspicuity of detail and expression.

He considers the (Κῶας) Koas (VII. 1.) as the main river, as it indeed has a much longer course than the Cabul or Cophen, which stream is not mentioned at all. Hence according to him, the Koas disembogues into the Indus, and the Suatus (in the Indian language Zubhavastu, the Sewad) into the Koas. He knows the sources of the latter in the mountains of the high north, which he calls the mountains of the Komedes

Under the sources at the Koas there live the Lambagæ,

* Strabo, XV 26

† Old Persian arrow-headed inscriptions, p 110

(Lampatæ) whose hilly district extends to the mountains of the Komedes, hence up the valley of the Kameh and into the Caucasus over the Pengkora or Guræus, a country of wide extent, while in Sanscrit *Lampaka* denotes only the inhabitants of the valley Lamghan, on the western side of the Kameh valley. Ptolemy's authority gives us evidence, that the restriction of that name (Lamghan) is of a more modern date, and that the derivation of the name from Lamech, according to Sultan Baber's conjecture, is a wholly vicious etymology. The peculiar Lamghani language, prevailing in this mountain valley, together with the language of the inhabitants of the higher Kameh valley and the Indian Caucasus, viz. of the Kafirs, thus called, is an Indian dialect, and the separation of the Lamghanians and Kafirs into different nations, as is the case in Cabul, is not founded upon any original national discrepancy

According to Ptolemy, the Koas is the most western river of India, however, he does not consider it as the boundary river, but in his opinion, the confines between India and the country of the Paropamisades are the meridian, in which the sources of the Oxus* are included, he places them one degree more to the west than the Koas, and therefore according to him, a district westward from the Koas still belongs to India, which as it appears, is inhabited by the Lambagæ, *he* (Ptolemy) mentions; for the present Lamghan is included in the very same district to which Ptolemy has assigned no other inhabitants. These national boundaries almost completely coincide with the political demarcation between the Satrapies of Alexander, viz. between that of the Paropamisades and of the Upper India.

Looking to eastern Cabulistan, we observe, the district Suastene lies, according to Ptolemy, at the sources of the Suastus, it is therefore the same that Elphinstone has called Upper Sewad.

He places the situation of the country Goryaea (*Γωρυαία*) below the Lambagæ and Suastene. This is the district between the Bagur and the Pengkora, and on the other hand, that to the Lundye, in the north of the Cabul river to the mountains, which include the Kameh from the east.

The name Goryaea is therefore used by Ptolemy, as it appears in a more comprehensive sense, than the name of the nation of the Guræi is ordinarily used by the ancient (geographers). The evident carefulness with which Ptolemy always proceeds in the applications of names, renders it not improbable, that he had good reasons in using that name in a more comprehensive sense. Goryaea (perhaps Gârjâ in the language of that country,*) seems indeed to point to an expression like *Kohdaman* in our days, (west from the Kandar hills,) the mountain district below the highest ranges of the snow-clad peaks

Ptolemy places between the Suastus and the Indus, the Gandarians, to whom the town Proklais (Poklais) is appropriated; here then the Gandarians are restricted to the northern bank of the Cabul river, for Proklais is the *Peukela* of the ancients, and the *Pushkala* of the Indian geography; according to Strabo the Kophen still runs through the Gandaritis. The dominion of the Gandarians, as it appears, is therefore restricted to the northern mountain valleys, and Ptolemy is instrumental himself in explaining this. In describing the extent of the Indo-Scythian empire, he observes, that its main part is situated along both banks of the Indus, but he also places Indo-Scythian towns just in the country along the lower part of the Cabul river, i. e. just in the old seats of the Gandarians. Among them Artoartar appears even to be the capital or the royal camp of the horde. Artoartar is there a foreign word, and arta reminds one rather of the Parthian than of Scythian elements of the language, it is the *arta* of the names Artaxerxes, Aideshir, &c. But since upon Scythian coins *Athro* and *Ardethro*, consequently Persian names of Gods are observed, it is no wonder, that we meet likewise in their towns with elements of Iran.† Artoartar having

* From *gari*, in Sanscrit *giri*, mountain, Zend *gauri*, there consequently perhaps *gari*. The modern word in Affghanian language is *gur*, but hence it does not follow, that Goryaea must be derived from that language.

† Artoartar 121° 30', 31° 15' Nagara 121° 30', 32° 30' Divertigum Coae and Paropamisades 121° 30', 33° 0' the juncture of the Cabul and Kameh, Nagora and Artoartar were therefore situated in the same meridian. But since the course of the Indus as well as the country bordering to it is displaced much too far towards east and west, the real situation of those three places cannot be looked for in the same meridian.

been ascertained as a town of the Scythians in the country of the lower part of the Cabul river, gives evidence, that the Gandarians had at that period no longer the dominion in their native country, and it offers itself the conjecture, that an independent power of the Gandarians maintained itself only round Peukela. Of the towns which Ptolemy still mentions as lying in these Indian confines, *Náγαρα ἢ καὶ Διονυσόπολις* is especially notable, *Nagara*, a genuine Indian word, is the name of the town, it therefore probably had with the Indians the meaning of the principal town of this district. The term "*town of Dionysos*," cannot be attributed but to the Greeks, who full of the expedition of Bacchus to India, thought, that they recognised even in this town the vestiges of his energies. If Ptolemy has correctly fixed its situation, it would lie opposite to the mouth of the Kameh. As, however, the whole country is assigned another position in geography, this only is certain in the statement of Ptolemy, that *Nagara* was situated on the southern bank of the Cabul river, not far from Jelalabad. Below *Nagara* there follow four more towns, assigned to Indo-Scythia, *Nagara* itself is not numbered among them.

When we now turn to Ptolemy's description of western Cabulistan, this is, in his opinion, the country of the Paropamisades *. The eastern boundaries toward outer India are already defined; Jelalabad and Lamghan belong to India. Bactria borders it in the north, the natural confines there being the Hindookush; in the south is Arachosia, from which the Paropamisades are separated by mountains under the name *Παριῆται*. Mr Ritter asserts, probably correctly, that they begin at Sefidkoh, and extend to the table land of Ghuznee†. It is indeed a very general term, *parvata*, mountain, and the name recurs for the northern tribe of the Arachosians, viz *Παραυῆται*; as it is the same name, so it is undoubtedly the same nation, the mountaineers on the right bank of the Ghuznee river. Ptolemy supposed these mountains to extend from east to west, while they run south-west. He fancies, as does Strabo on the authority of

* VI 18

† See the map to the essay above mentioned

Eratosthenes, that the country is a square, and on this supposition he defines the place of the different nations. The *Cabohitæ* live according to him, towards the north, namely in the valleys of the Gurbend and Panjhir, the town *Ortospana* or *Caburg* in the centre of the country (which is certainly identical with the modern Cabul), supplies their name. The *Aristophylæ*, a Greek name, have their abode in a westerly direction towards Aria; we must look for them below the Kohi-Baba. Further down are seated the *Pabu*, or after another reading, the *Parsu*, the *Ambautæ*, lastly, live in the east, and are therefore the neighbours of the Lamghani; this name has likewise turned out useless, and we cannot draw any conclusion from it.

It is strange, that Ptolemy does not mention the tributaries of the Cabul river in this part of Cabulistan, it is said, at least he does not; however, the river *Γωβρύασις*, into which another dis-embogues, is probably the Gurbend, and the nameless river is perhaps the Cabul itself, the Kophen of old, of which there is made no mention.

Of the names of towns, Cabura has been already touched on; traces of the town of Alexander have disappeared at this place, and it is difficult to look for it under another name among those that Ptolemy noticed; but we shall still make especial mention of one among them *Artoartar* recurs here, as it were to show us the old seats of the Scythians, from which they started for the Indus. It lies in a north westerly direction from Kabura, and just in the mountains, where the passes lead from the sources of the Cabul river to Bamian.

In the statement of Ptolemy it appears much more distinctly than in those of the Macedonian period, that eastern and western Cabulistan were likewise, in a national point of view, separated into two equal divisions, almost consentaneous with their natural boundaries, the western half belonged to that nation, whose separate tribes are comprehended under the general name of the Paropamisades; the eastern is numbered with the Indians; but the plain at the lower part of the river is now under the power of the Indo-Scythians, and perhaps only Nagara, and the Gandarians give the appearance of independent Indian nationality. It is a great loss, that Ptolemy does not furnish us with

any information on the political statutes of western Cabulistan. Upon these, as well as upon the national relations, a much clearer light is thrown by those accounts, of which we shall presently make use. We allude to the reports, given by the Buddhist Chinese travellers, which are contained in Abel Rémusat's posthumous work, so important to Indian geography.*

There are three such reports, the most ancient of which is, however, alone completely published. First, the report of Fahian, who in the year 400 A. D. made a pilgrimage to India.† Secondly, that of Soung Yuntse and Hoëiseng, who in the beginning of the sixth century were in India‡ Lastly, the report of Hiuan Tshang, who came to India about the year 632 A. D.

As these travellers were Buddhists, and pilgrims to the holy places of their belief, this religious purpose is the prevailing subject in their narrations, and they omit many things on which it would have been of far greater importance to us to obtain information. But their narratives, as given by eye-witnesses, are invaluable, and we observe no trace of their having told what was not reported to them, or what they did not see, or imagine they saw. Their estimates of distances, when referring to extended measurements are indistinct and exaggerated; fortunately they mention so often places easily to be recognised, that we can generally set ourselves right without difficulty in the countries they have enumerated.

But if I now venture to differ in many instances, as to the interpretation of these Chinese narratives, from Abel Rémusat and his two successors, Klaproth and Landresse, as well as from our celebrated geographer Mr Ritter, I have briefly (for the detailed exposition of this Chino-Indian geography must be reserved for another place) to vindicate my deviations.

Rémusat first of all displaces and alters the situation of all the countries of western India by supposing, that the Indian district *Gandhara* is the same with Kandahar (in Sanscrit *Kandadhara*.) Then, according to him, Fahian visits *Tchuchachilo* or *Tant-*

* Foe Koueki, &c

† p 3

‡ p 354

chachulo, which the Chinese, however, only described by hearsay ; and as Fahian does not mention his having gone there over the Indus from the west, Rémusat inferred, that the situation of *Tantchachulo* must be on the western bank ; but it is in fact the *Taxila*, (*Takshazila* of the Indians) between the Indus and Hydaspes, Rémusat was therefore under the necessity of displacing all the districts of the western Indian frontier, too far westerly We may again trace, in the report of Hoeisang, the confusion of Gandhara with Candahar, and the river *Southeou*, which is but the Indus (with Fahian *Sintheou*) is removed to Kandahar. I undertake to prove these assertions good in all their details, if their correctness be disputed.

I shall now state, with regard to every province, the grounds on which its situation is fixed.

Udjána, *Outchang*, as it is called by the Chinese, according to Prâcrit form, *Uyand*, (garden, park) is bordered by the Indus to the east ;* the name of the capital is *Mengholi*, (*Mangala*, the fortunate), and it is probably situated in the valley of the river *Souphofasoutou*, as they call it, or of the Zubhavastoo, the Sewad, or Suastus. Fahian mentions, however, not by name two other rivers, probably the Penjkora and the Bagur. If Rémusat says, the country was bordered by Kandahar in the west,† we observe in the original *Kiantolo*, (or *Gandhara*). This has lead Mr. Ritter to the mistake of looking for Udjuna near Jelalabad,‡ but it lies to the northward from Gandhara, therefore on the northern side of the Cabul river.§

We extract the following notices from the copious collection of Chinese narratives published by Rémusat The name is said to have been given to the country by an Indian king of old, who was wont to hunt here, it was his park. Baber also used often to hunt here. Besides the Buddhists, there also resided here a number of Brahmins, who were much devoted to astrological inquiries.

Buddha is said not to have advanced beyond this. Here we still find Indian letters, and an Indian dialect, but no where

* Fahian, p 45 Hiuan T'sang, p 380

† p 46.

‡ Erdkunde, VII p 289

§ Foek, p 379.

beyond, i. e. towards the north, where the Caucasus forms the natural separation of the nations. But Hiuan Thsang says, perhaps with more exactitude of definition, that the language is Indian, though with some deviations * Udjana is many times mentioned as an independent empire in the Chinese annals between the years 400 and 642 A. D

The little principality Suhoto was situated southward from Udjana, and westward from Kiantola beyond the river (Cabul), if one set out for it from Kiantolo.† This definition is not very clear, it must be about the country within the angle between the Kameh and Cabul, on the northern bank of the latter Kiantolo (or *Kianthovei*) is bounded on the east by the Indus,‡ the situation of the town *Foe-chafou* was in a westerly direction, three journeys distant from the Indus. (p 355) Westward thence was the town Kiantolo, with the tower of the king Kanishka, the same town is also called *Poulouchapoulo*, or *Foe-Leoucha*, and *Paloucha* seems to be a variety of *Foechafou* North-eastward fifty *lis* beyond the Cabul river (about fifteen miles), there was situated the town *Pousecolofati*, (or Pushkalavati,) the district attached to the town Peukela on the Indus, the *Peukelaotis* of ancient writers. The way from the Indus to Peshawur is estimated to be three journeys;§ in this town we recognise *Foechafou*. This country is the Gandaritis of the ancients, the Ghandhâra of the Indians, and the concurrent testimony of the Chinese narratives does not at all admit its being extended to Kandahar. The capital, the name of which in the Indian language perhaps was Purushapura, *town of men, town of heroes*, is to be looked for, it appears, in the country of Khybers. There is yet a tope, larger and more splendid than that of Manikyâla,|| but this can hardly be the tower of the king Kanishka.

Fahian describes *Foeloucha* as an independent little state, the repetition of the same account proves, that the capital of Kiantolo, and the town *Purushapura*, and this *Foeloucha* of the

* Foek, p 381

† Foek K, p 64 p. 45 p 355

‡ p. 379

§ Tieffenthaler's description of Hindoostan, I p 46

|| As Trans. III. 327 VI 879

three reports is the very same with the tower of the king Kanishka From Peshawur Fabian takes a southern, Hoeiseng a western direction to arrive there, the Khyber mountains lying to the southwest.

This *Parushapura* is the same from which Remusat, and after him M^r. Ritter* presumed to infer, that the *Belujens*, strong favourers of Buddhism, already existed at that time I do not know whether Mr. Ritter will allow these Belujens of his to break a lance with a critic

From *Foeloucha* westward to Nakie there are sixteen jōanas † Hiuan Thsang corrects the name into *Nakoloho*, he comes there from *Lampho* (or Lamghan), crossing the great river (Cabul); it is a distance of 100 lis, or a little more than five geographical miles.‡ *Nakoloho* lies in the valley of the river *Hilo*, where is the town *Hilo*, one (geographical) mile from the capital, a mountain is also called *Hilo*, at which *Nakoloho* was situated (p 86. p. 54)

This river on the southern bank of the Cabul cannot well be any other than the Soorkhrood, and we must look for the town *Nakoloho* at the mouth of the stream in Balabagh The Buddhist monuments, said to be near *Hilo*, are the same with those on the Soorkhrood from Balabagh to Jelalabad. (As. Trans. III, p. 325)

I imagine I recognise the river *Hilo* in the Hu of the map of Danyille and Rennel, at the junction of which with the Nilab, the town Nagar is situated, there is another river Hir to be accounted for in accordance with the different narratives, which is said to pass the town of Cabul. If now *Hilo* certainly be the same name, *Nakoloho* also appears with the same certainty a Chinese paraphrase for Nagara.

This leads us again to the Nagara of Ptolemy, which must needs be situated westward from the curvature of the Kameh river On account of the evident similarity of the names the conjecture will be admitted, that his Nagara is not different

* Erd VII 678

† p 85

‡ p 378 The five miles must be taken from the places nearest to both banks of the river

from *Nakoloho*. His Artoartar might coincide with the town *Purushapura* of the Chinese

For *Hilo*, and *Nakoloho*, (or *Hir* and *Nagara*) another supposition is possible, the correctness of which I have not the means of deciding. If namely, near Jelalabad, itself a tributary, falls into the Cabul, this might be the *Hir*, and *Nagar*, the Jelalabad. The name *Hir*, however, leads of itself to Soorkhrood, (red river) if the Indian word *hiranga*, (gold, of gold colour,) may be recognised in it, and besides in the latest descriptions of Cabulistan, no other notable river, except the Soorkhab* is made mention of. The architectural monuments of this country, moreover, which commence at Balabagh, are not discovered more than four (English) miles beyond Jelalabad. This circumstance, and the fact, that Lamghan lies opposite, led me look for a higher situation for *Nagara* on the banks of the river.

Nakie in the year 628 A. D. was subjected to the empire *Kiapiche* on the Gurbend, it was the boundary district between Gandhara and western Cabulistan.† The town was sixteen *jôanas* from the capital of Gandhara, or, according to others, fifty *lis* in a northerly direction from it beyond the mountains,‡ a distance of about twenty-five geographical miles. Tieffenthaler estimates the way from Soorkhab to Jelalabad at twenty-four (miles), and the capital of Ghandara cannot have had a much more eastern situation than Jelalabad. The way of Hiuan Tshang, however, did not follow the river, but the mountains, and it was perhaps more direct.

To set ourselves right in western Cabulistan as to the Chinese description of it, we must begin with Hiuan Tshang's entrance from the north into the country. He goes from Bamian eastward over the snow-clad mountains, then over those, called *The Black*, and is then in the country *Kiapiche*, the distance is not stated, but as the town *Kiapiche* lies in the mountains, he has probably gone from Bamian only into the next valley towards

* M. Court conjectures "sur les marches d'Alexandre," p. 28 elle (la rivière de Kabool) entre alors dans la vallée de Djelalabad, où elle reçoit d'abord les eaux du Sourkhab, qui vient du Canton de Peiver et ensuite celles de Khonar (Kameh) qui a sa source dans le Kaferistan

† Foe K p. 89

‡ Hiuan, Tshang, p. 379

the east. A pass leads in an easterly direction from Bamian into the valley of Gurbend; Baber has described this defile;* I refer for this to the corrected map of Burnes; 200 *hs* northwards from the capital are the great snowy mountains, consequently the Hindookush, so that the capital cannot be Cabul, as Mr. Landresse conjectures. It was then (632 A. D.) an independent empire, to which some neighbouring states were subjected; we know this fact already of *Nakie*. There was the old kingdom of the Gandharas, not perhaps of the Indians, but of the Scythians, who took afterwards possession of the Indian Gandhara. Ptolemy places the town *Kapsa* two and a half degrees northwards from *Kabura*, and Pliny,† (VI 25. 23) when numbering the countries westward from the Indus says, “a proximis Indo gentibus montana Capissene habuit Capissam urbem, quam diruit Cyrus.”

It is undoubtedly the *Kiapiche* of the Chinese.

This district is indeed not assigned to India, but most of the places, the names of which are cited by Huan Thsang, can be derived from Sanscrit roots. The mountain *Pilosolo*, (steady as an elephant,) is *Pilusdra*, but this very term for “elephant” is considered as introduced into Sanscrit from another language.‡ I only mention this in order to recall the affinity observable here to an Indian language.

When Huan Thsang leaving India‡ on his pilgrimage had passed the snowy mountains, he descended for three journeys, and reached *Anthalofo*. This is *Anderab* in the Balkh. On the southern side, the furthest state is *Foelchisatangna* (sthâna), where a Turkish family reigned in the capital *Houphina*. Baber made his first march to Cabul from the north through the Panjhir or Kip-chak pass. He says, “On arriving at the top of the pass, Upiân or Hupiân, I saw for the first time the star Soheil §” This statement determines *Houphina*.

Below *Houphina* the empire *Thsaokruitho* was situated, attached in Huan Thsang's time to *Kiapiche*, it was therefore in the valley of the Panjhir river. Here also he makes mention of

* Denkwuerdigk, p 363

† De pentap Ind p 84

‡ p 395 § p 262

Stoopas, which are attributed to the Indian king Azôka. The language and characters of this country were, however, not Indian.

The empire *Falanou*, extending to the south, the situation of which most probably is on the river Baran, still belonged at that period to the kingdom *Kiapiche*. This river is often mentioned by Mr. Masson, and still more often by Sultan Baber, and it is strange enough, neither of them distinctly say what river is meant by it. According to Baber, the Alingâr dis-embogues into the Baran, (p 276) and in travelling from Cabul to Lamghan on crossing the Baran, § two distinct plains are met with between the foot of the mountains of Gurbend, and the river Baran. Baber goes down along the Baran to collect the revenues of Nijrow. Hence Baran must be the name for the united Gurbend and Panjhir rivers downwards to Lamghan. The statement of *Falanou* lying below *Thsaokrutho*, leads to the same conclusion, and it is a much more certain one than the distances, incorrectly stated regarding this immediate region, enable us to arrive at; but I cannot enter here upon an examination of them. It must be the Kohdâman, perhaps the Verena of the Vendidad. Beghram probably was, in *Falanou*, separated, as it appears from Cabul. *Falanou*, though a province of *Kiapiche*, is still assigned to India, however little similarity the language is said to have had to Indian idioms. It seems to have been here, that the distinctive separation of the spoken languages occurred.

In his journey to India Hiuan Thsang, does not describe *Falanou* and *Thsaokrutho*, but he goes from *Kiapiche* to *Lampho*. This seems to intimate, that he travelled a mid-course, between the two above mentioned countries, upon the great road, which, leaving *Thsaokrutho* to the left and *Falanou* to the right, leads over Beghram to Nijrow, Lamghan and Jelala ad. (Masson As T. V. p. 2)

Lampho is 600 *hs* distant, in an easterly direction, from *Kiapiche*, the way goes through difficult defiles, it was on the confines of India, and lies about the Black mountains; they are perhaps the Siahkoh on the river Kohdâman. (Masson I. 1. p. 2)

Lampho certainly cannot be any thing other than Lamghan,

the *Lambagae* of Ptolemy, and *Lampaka* of the Indians. In Lamghan there exists an old monument, which the Mahomedans pretend to be the tomb* of Lamech, which Hiuan Thsang has perhaps visited.

The aboriginal inhabitants of Lamghan still use an Indian dialect, and it is indeed a very remarkable fact, that the national contrasts of these people may be so distinctly traced throughout various periods. Ptolemy and Hiuan Thsang entirely agree as to this point, and we have besides the language in corroboration. Hiuan Thsang did not meet with an Indian language, or Indian characters in the valleys beyond the Kohdâman, within the Kohdâman itself, there was a certain similarity with the Indian dialects. On the southern bank of the Cabul river, *Nakoloho* is the extreme boundary of India.

I hope, that I have thus illustrated, though very briefly, the Chinese description of those districts; there remains yet another province, which the Buddhist pilgrims, whose reports are available to us, have not visited, to complete this sketch, and it must be still touched upon. This is *Kipin*, which Fahian mentions, without having advanced so far himself,† it is entirely passed over by Hiuan Thsang. It often occurs in the Chinese annals, from soon after the year 142 B. C. down to 758 A. D.,‡ it was then united with Udjana. In the beginning of the sixth century it waged war with Gandhara on a boundary question, (Foe K. p. 354) and must therefore have possessed those districts which were adjacent on the west to Gandhara. As the Chinese annals make mention of relations between *Kipin* and the Chinese court, but not of any with *Kiapiche*, we might be disposed to presume, that *Kipin* was the diplomatic expression, used to indicate the complete empire *Kiapiche*. But the statements point to another situation. *Kipin* was 700 *hs* to the southward from Bamian, and not eastward as was *Kiapiche*, and 400 *hs* eastwards from *Sieyu* with its capital *Husina*, which must be Ghuznee. These accounts lead one indeed to the neighbourhood of Cabul, which is not mentioned in the reports of the

* Baber, p. 276. Hence he derives the name

† p. 22.

‡ The reports are collected by Ritter VII. 682

pilgrims. Here Remusat's assertion, that Kipin is the country about the Kophen, seems to be confirmed. It is the tract about the sources of the river rising to the west of Cabul. It accords with this opinion (to maintain) that Kipin was distinguished as a state independent of *Kiapiche* and *Falanou*, and is made mention of as a principality which bordered upon Gandhara, and at one time also possessed Udjana. It is likewise in accordance with the above, to distinguish *Kaofu*, by which term Cabul seems to be meant, from Kipin. The one fact is evident, that the word *Kipin* was used in a more extended and more limited sense at different periods. The Chinese accounts most forcibly support what has been already theoretically inferred from the geographical character of the Cabul districts, that they easily split into a number of petty principalities, subjected to constant alteration as regarded their extent and their boundaries.

§ 12

The Alphabetical Characters

We will first inquire as to the lettērs (used in these countries), and this inquiry will be made rather with reference to their historical than their paleographic relations, as these latter cannot be explained in all their bearings (consequences), without our having obtained the perfect alphabet.

First, as to their nature. The letters are partly independent, i. e. such as occupy their own places in the line, and partly dependent, such as the vowel signs, the former are either consonants, or diphthongs, or vowels commencing a syllable.

Let me first put together the consonants, as we have discovered them.

Gutturals	.	ᳵ	k	ᳶ	kh	᳷	h
Palatals	. . . . .	.	.	.	᳸	(j)	
* Dentals	. . . . .	᳹	t	.	ᳺ	d, ᳻, dh	
Labials		᳼	p	᳽	f	(doubtful)	
Semivowels	..	᳾, j	᳼	r	᳽	l, ᳿, v	
Sibilants	... ..	᳼	z	᳽	sh	᳾	s
Nasals	.	᳼	m	᳽	᳾, n		

Finally, an uncertain sign f

THIS table shows still some deficiencies ; we still want a G, which I do not venture to adopt from a doubtful word of the inscriptions on the topes ; we may also look for a K (क) and a B, perhaps also the softer sibilants This conjecture is founded upon the observation, that the characters still undecyphered, are as many as there are letters deficient ; and under this idea, the supposition that the language may not have possessed convertible, and intermediate consonants, is nullified.

The diphthong ढ, ô, is always written within the line ; the same must also be supposed as to the analagous ॠ ê, though this is not yet determined with certainty.

The vowels ङ, a, and ॡ, u, appear to be ascertained, but ङ, ॠ, is not so certain. If the remark, that in the alphabet the different quantities of the vowels are not expressed, be well founded, we have not to look for further additions to the vowels , but we must still wait the decision, as to whether the sign, supposed to denote the shortened u, can be proved correct, or whether ॡ was ordinarily substituted for u. Upon this supposition, however, would arise a contradiction as well in the mode of representing the vowels between ॠ, and u, as also in the manner of expressing the Greek v. The vowels ॠ, and originally, as is most probable, u, also, when following consonants, are denoted by peculiar marks, annexed to the consonants ; the ॠ by a small perpendicular line drawn through the consonant from above ; u, if our supposition be correct, by a small angular projection to the right

A, is considered as inherent in the consonant, and a consonant which presents no other sign of a vowel, must ordinarily have the vowel a, whether long or short A, being excluded from a final consonant, is not denoted by any sign. There seems to exist a diacritical point for distinguishing similar characters ; a small cross line annexed below is a mere calligraphic ornament

(To be continued)

Journal of a trip through Kunawur, Hungrung, and Spiti, undertaken in the year 1838, under the patronage of the Asiatic Society of Bengal, for the purpose of determining the geological formation of those districts — By THOMAS HUTTON, Lieut, 37th Regt N I Assistant Surveyor to the Agra Division

PART II

On the 15th of June, the thermometer, at sunrise, indicated 47° , at an elevation of 10,522 feet above the sea. This morning we started betimes, and once more proceeded in search of the habitations of men.

About a quarter of a mile from camp, we had to cross a torrent, whose waters were luckily at this early hour of the day, reduced by the frosts on the heights from which it came, but yet its force was such, that it required some care and exertion of strength, to enable a man to stem it safely. Seeing me make preparations to wade through it with the rest, a couple of sturdy Tartars at once came forward, and while the one stooped down and offered me his back, the other, before I could say a word, had bound me to it with his red sash, like any other load, and away they trudged into the stream, where after several awkward stumbles, caused as much by their laughter at my apparent uneasiness as from the violence of the stream, they gained the opposite bank in safety, and released me from bondage. They then gave assistance to several of the loaded people, and seemed to care little about the coldness of the stream, although its temperature was 36° , and the hour of the morning, seven.

The streams, whose waters are supplied from the melting of the snows above, are often only passable in the early hours of the day, when their sources are still bound up by the frosts of the preceding night, swelling so rapidly towards the afternoon, under the influence of the sun's rays, that neither man nor beast can stem them. I saw an instance of this in a stream at Hungo, where at four o'clock in the afternoon its breadth was upwards of twenty feet, while at seven next morning, when I crossed it, it was, though still strong and violent, barely eight feet across.

While on the subject of rivers, it may not be amiss to notice an error which Dr Gordon has inadvertently fallen into. In his account of a voyage down the Indus to Bombay, he attributes the small quantity of water observable in the Sutledge and Garra, during the winter months, to have been occasioned by the failure of the rains in the hills, during the preceding season.

The fact is, that these rivers are not at all dependent on the rains for their supplies, but like all those which have their sources in the hills, are fed, during winter, from the snows alone, and the small quantity of water remarked by Dr Gordon, was occasioned by the severity of the frosts in the upper hills, which had bound up their sources in ice.

The rivers of the plains are most swollen during the months of June, July, August, and September, because at that season the frosts on the snowy ranges are less severe, and the snow melts away beneath the influence of the summer heats from all the inferior elevations, supplying the rivers with abundance of water, which again gradually decrease in violence as fresh autumnal frosts and falls of snow occur.

This too is annually proved to be the fact by the rapid rise in all these rivers during the hot months, before the rainy season has commenced.

As the rivers are most swollen during the prevalence of the monsoon, it may appear to the inhabitants of the plains that the rise of the waters is to be wholly attributed to the rainy season, and that the volume of their waters diminishes as the rains gradually die away. This, however, would prove a very erroneous idea, for although undoubtedly rivers after *coming within* the influence of the monsoon, receive immense additions from the drainage of the surrounding country, yet it must be remembered that they are not at all affected by the rains through a great portion of their passage through the mountains, and especially in those regions where they take their rise.

Thus they could merely receive those additions *during the prevalence* of the monsoon, and whether the rainy season had been heavy, or the reverse, it would exercise no influence over the rivers during the winter months, or in any way affect the quantity of water at that season.

The sources of all the larger rivers from these hills are situated far beyond the influence of the periodical rains, and consequently the total failure of the monsoon could but affect them during that particular

season, and then only in those parts within its influence Did these rivers owe their origin to the rains, the remark would have been correct enough, but as they derive their source from lakes, and are fed by snow waters till they have passed through the outer barriers of the snowy range, it must be apparent that the shallowness of their streams in winter is owing solely to the severity of the frosts above

The volume of such rivers during winter, even many hundreds of miles from their sources, will always furnish a sure, and never-failing index to the rigour or mildness of the seasons in the mountain tracts from which they take their rise, for if the winter be mild above, the rivers will possess a more abundant supply than when the contrary is the case, and the changes too, which take place above, such as frosts and thaws, will always be marked by corresponding changes in the volume of the rivers

An instance of this kind fell under my own observation during the passage of the Indus, in January 1839, near Shikarpore, by His Majesty Shah Shooja During the few days occupied in crossing his troops, the river fell amazingly, so as to lay bare some sand banks which had the day previous been deeply covered with water This was of course occasioned by severe frosts in the regions of the Himālaya through which the Indus and its various tributaries flow, and shortly after, I received letters from the hills, which stated that the winter in the higher tracts had been severe, and that much snow had fallen The subsequent melting of this snow a little later in the spring, again caused such a rapid rise in the waters of the river, as to add greatly to the labours and anxiety of the engineers who were constructing a bridge of boats at Bukkur for the passage of the army of the Indus, for the swell of the waters was so great as to threaten the destruction of the bridge, by sweeping away the boats

In the stream we had just waded through, a man and his pony last year in attempting to ford it at midday, were swept down by the force of the current, and hurried into the Spiti, where they were both lost in the rush of waters

Our path from this treacherous torrent continued tolerably level, along the side of the river, one while broad and good, as it led us across the alluvial flats, and again affording scarcely room for the foot of any living creature, save the sheep and goats which had formed it.

About half way between our last encampment and the village of Larree, to which we were journeying, stands Soomra, situated on the right bank of the river, and within the district of Hungrung; it is built on one of the accumulations of alluvion so often alluded to, and in which the valley abounds

Many of its fields are now uncultivated, and the village itself, though appearing to possess many houses, is occupied by *three* families only, each consisting of from six to eight souls. There were lately two other families residing here, but they could not rear sufficient to recompense them for their labour, and have emigrated to some other place.

Near this we fell in with a large flock of beautiful sheep from Choomoortee, which was travelling to Dunkur for grain. The sheep are driven from village to village with the wool on, and as the required quantity is cut from their backs, they are laden with the grain which is received in exchange, and which, when the fleece is all disposed of, is carried up into Chinese Tartary and sold at a profitable rate

The wool of the Choomoortee breed is very fine, and much longer than that of the low country sheep, it is therefore in much repute, and purchased for the purpose of making birmore, sooklat, and blankets

The wool called "pushm," from which shawls and pushmeenas (shawl stuffs) are made, is entirely obtained from a breed of goats resembling those to which the name of "Cashmere," has been applied, they are often four or five horned, and do not thrive below Poee and Soongnum in Kunawur, both because they are unable to bear any degree of heat, and on account of the humidity of the lower climates. Their true habitat is in the higher and remoter regions of Chinese Tartary, where they attain to their greatest perfection.

The pushm is a remarkably fine wool, very silky and soft to the feel, and grows at the roots of the long hair with which the animal is clothed. It is obtained in the summer months by *shearing* the goats, in the same manner as sheep, and afterwards separated from the hair, which is not thrown away, but reserved for the purpose of making ropes, as hemp is unknown in these higher tracts. This wool is afterwards brought to the lower hills for sale, and forms one of the chief exports from Tartary. The pushmeenas, which are manufactured from it, are chiefly from Rampore and Cashmere

The skins of this breed are also used by the Tartars as an article of dress for the winter, and form with their long hair and thick pushm, a

warm and comfortable garment, which is worn with the hair inwards, in the manner of a cloak

A fine pushm is also obtained from the large breed of Tartar dogs, usually termed "Thibet mastiffs" (*Canis Molossus, var Thebitanus*), but it is not in sufficient quantities to form an article of commerce, although it is said to be far superior in quality to that of the goats

Captain Herbert remarks, that, "the Government has not succeeded in introducing the shawl goat either into Hungrung or Kunawur This as regards the former district is a mistake, for although they will not thrive in the more humid climate of Kunawur, they abound in Hungrung and in Spiti, although the breed is not reputed so good or productive of wool, as that of higher Tartar districts

This third march at length brought us to an inhabited place, and there we halted for the day The village of Larree is situated on the left bank of the Spiti, on a deposit of alluvial soils It is nevertheless a poor place, and contains but *three* families, consisting of about twenty souls There are some good flocks and herds of yáks belonging to this village, which however were all away on the heights at graze, the neighbourhood of Larree producing nothing in the shape of pasture Here growing in the fields among the grain, were many plants of a very pretty and delicate iris, which I had observed also at Chango, in Hungrung, it forms the third species I have met with in my trip The flowers are of a pale blue, and the petals delicately veined with a darker tint, there was also a white variety of the same, occurring in some abundance Another very beautiful flower was also seen spreading along the ground in stony or otherwise barren places, and bearing a large white blossom, it occurs throughout Tartary, and in some of the higher parts of Kunawur, and in the former country is called "Kābrā"

On our arrival at this village the people refused to have any thing to say to us, and to our demand of grain, &c, they declared they possessed none, as in the preceding year the village had been plundered by Runjeet's troops, and the present crop was not yet ripe This my guide declared to be a lie, as he knew they had plenty, but were fearful that we should help ourselves without giving payment for what we took

After a long parley they were induced to bring a small quantity of flour, which they offered for sale at four seers for the rupee. This,

I at once refused to take at such a rate, as I knew they were selling it much cheaper among themselves, and I had purchased it at Chango at twelve seers

I therefore opened my own store and supplied my people for the day, but even the knowledge that we could do without their grain failed to reduce its price. Nor was I more fortunate in obtaining a sheep for my own use, for they would not produce a fat or a healthy one, but brought me an *old ewe*, which looked like the mother of the flock, and declining to buy her, I was necessitated to take a two year old he-goat, or to go without my dinner

Leaving Larree on the 16th of June, I continued my route towards Dunkur. A short walk, during which we had to ford two streams, brought us to the village of Tābo, which is chiefly inhabited by Lamas, who cultivate the soil, and attend also upon the takoordwara, or temple, which is a large building, and ornamented inside with a number of earthen figures of their gods, by no means badly executed. These are arranged along the walls of the principal rooms, which are also painted with many grotesque figures and flowers connected with their mythology

Last year when the Ladak rajah was obliged to seek protection in Bussaher from Runjeet's troops, the figures in this temple were sadly mutilated. The houses of the Lamas were pulled down, and the noses and hands of the idols were cut off and thrown into the river. This outrage is generally attributed by the people to their invaders, but in reality it seems that it was perpetrated by the followers of the Ladak rajah themselves, who when deserted by their master, thought to ingratiate themselves with their conquerors, by assuming the same form of turban, and mutilating the gods of their own countrymen. If asked who defaced the images, the Lamas always accuse the "Singa," as they term the Seikhs, but when questioned as to the numbers who invaded them, all accounts agree in stating *six* or *seven* men, and the rest were the adherents of the Ladak rajah. These fellows also, finding the opportunity favourable, and knowing that the blame would be laid upon others, plundered every village in Spiti, and levied a fine of fifteen rupees on each, with a threat that they would repeat the visit. Every excess is however attributed to the Seikhs

From T. 50 we proceeded towards Pokh, or Pokhsa, by a road which

one while led us along the margin of the Spiti, and at another, up over crumbling rocks of slate which overhung the river. These heights were sometimes of a frightfully dangerous nature, the soil being so loose and crumbling, that often the pathway had slipped down altogether into the waters below, and left a gap over which we were obliged to pass by making holes for our feet, while we literally overhung the roaring torrent at a height which made one shudder to behold. I am quite sure that had I been left to myself, I should have fallen from the very care I took to avoid it, and from the mere fear lest I *should* fall, but the people about me were well used to such kind of places, and seemed to regard them no more than would a goat or a sheep, and as one gave me a hand to steady me forward, and another kept a hand at my back to reassure me, I managed to get across well enough, although I should previously have been very much inclined to say that the place was impracticable. So much however does habit hide the danger of any place, that on my return I walked along it without assistance, and without the least idea of falling, though the coolies preferred sliding down an easier part of the hill, and walking knee-deep in water.

A far more dangerous passage than this, was wading along the margin of the river Spiti, at a place where its waters had swallowed up the road. Descending gradually from the heights already mentioned, the pathway lies along the margin of the stream, at a place where the rocky mountain is too precipitous to be scaled. When the river is unswollen by the melting of the snows the road thus runs between it and the mural cliff which rises from the bank. Now, however, at this late period the waters washed against the cliff itself, and left no passage for about 200 feet, but through the stream. Taking hold of each other's clothes with one hand, and pressing the other firmly against the rock, we slowly and cautiously entered the rapid stream, groping along the bank up to our waists in water, whose temperature was any thing but hot, and whose force was such, that had any one lost his footing among the stones and fallen, he would inevitably have been carried down by the current, and most probably drowned. The distance, however, was not very great, and we reached the road again in safety, where it once more emerged from the river's bed. Luckily this cold bath occurred but a short distance from our journey's end, and hastening on we soon arrived at Pokh, where we were glad to strip off our dripping garments and warm ourselves at a blazing fire in the open air.

Pokh is a small and shabby looking village, and the houses, like all those of Hungrung and Spiti, are built partly of stone and partly of mud, or unbaked bricks, that is, of stone for the foundation, and bricks above, the walls are usually daubed over with whitewash, which, is obtained from beds of friable gypsum occurring among the clays at the lower end of the valley, the windows and doors are small, particularly the former, which are often not above eighteen inches square, and have a red frame or border. As usual there are no trees, except a few poplars and willows on the margin of a stream. There are, however some rose bushes and dwarf cedars in a glen behind the village.

Opposite Pokh, on the right bank of the river, is a large patch of cultivation, and a few houses, called "Pokh-mă-rüng," although the two are usually known under one name. The cultivation indeed belongs to the inhabitants of Pokh, and a communication is kept up by means of a joola, or number of ropes stretched across the river, on which passengers slide over. This joola had unfortunately given way just before my arrival, and two or three people who had gone over, were consequently obliged to remain on the opposite bank, for to swim the river at this season was impossible. The ropes used in the construction of this dangerous bridge, if such it can be called, are made of willow twigs twisted strongly together, and about the thickness of a man's wrist, these are sometimes four or five in number, and are fastened on either bank to an upright post driven into the ground. From these ropes a loop descends, in which the person sits, and pulls himself along. Many fruitless attempts were made to convey a new rope across the river, by fastening a stone to a long string, and endeavouring to throw it over to the other side, but not one man in the village could succeed, for the stone invariably fell into the middle of the stream. The Churriah and Tartars who were with me also tried their best, but with the same want of success. A bow and arrows were then resorted to, but they also failed to reach the bank, and the experiment was abandoned. The Mookiah of the village then said he would furnish a yăk, to whose tail one end of the rope was to be fastened, and the animal driven into the stream; if he succeeded in reaching the opposite shore, well and good, but if, as was most probable, the beast failed, and was drowned, he would abide the loss. As the yăk had to be brought from the heights where he was at graze with the herd, I did not see the experiment tried, but on my return

from Dunkur some days afterwards, the ropes were still lying at Pokh, and no joola had been conveyed across, so I conclude that the experiment had either failed, or had not been resorted to, although I forgot to make the inquiry

On the heights, in the neighbourhood of Pokh and Larree, the wild sheep is said to abound, but there were no hunters in the villages to send in quest of them, and the only one of whom Soomra could lately boast, was now no more

In the past winter he had described a flock upon the heights behind his village, at no great distance, and seizing his matchlock had started for the chase which was destined to be his last. Night came and passed, the day succeeded and passed also, yet no hunter returned, and at last alarmed at his prolonged absence, his son started in search of him, but all in vain. The traces of his footsteps were followed for some distance up the mountain's side, when, as if the hunter had been spirited away, or vanished into air, they suddenly ceased at a large fresh field of broken snow. Days and weeks passed on, and the wonderful occurrence of his disappearance had begun to be forgotten, when a sudden thaw took place, and his body was seen yet fresh among the snows, at the place where his footsteps had ceased. His gun was in his hand, and he lay as if in a sound sleep, but he was cold and stiff, for he "slept the sleep that knows no waking," he had been smothered in an avalanche from the heights above him. His were the fields at Soomra which we saw lying barren and neglected, for his family had left the place

Of birds, we saw but few, and they were chiefly the raven, and two species of chough, or red-legged crows. Chikores were abundant, and the shrill whistle of the Bhair, or Ladak partridge, was occasionally heard high up among the snows. Of the smaller birds, none but the hardy little sparrow was seen, and I could not help thinking that he, like the sons of Britain, appears in every corner of the earth

Leaving Pokh at sunrise on the morning of the 17th of June, we travelled for about three miles along a flat and extensive plain, strewed thickly over with boulders of every size. From this we ascended a short but steep hill, in a N.W.b.W direction, the river taking a somewhat sudden turn, forming an elbow, on the outside of which stands the village of Mānēss below the Mānērūng pass, a difficult and

dangerous road, which leads from Spiti into Kunawur, about seventeen miles from Soongnum

From this turn the bed of the Spiti becomes much broader, and numerous sand banks, or islands, are seen, some bare and barren, others producing shrubs of the barberry, causing the river to divide into many channels, which gives a pleasing effect to the scene. A walk of four miles along the hill side, brought us at length to our encampment beneath the fort of Dunkur

The fort and village of Dunkur are built high above the Spiti, among the ragged spires which crown the time-worn rocks that form its bank. This rock is inaccessible on every side, with the exception of that by which it is connected with the main range of hills, of which indeed it forms a spur, or offshoot towards the river. A stream descends on one side of it from the heights, and in former days a covered way existed from the fort to its banks, by which the garrison were enabled to obtain water unperceived by the enemy, this has however long since fallen into decay, and its ruins now alone serve to mark the line along which it formerly descended. As a place of strength, Dunkur was well calculated to hold out against the rude bow and arrow warfare, as once practised in these high tracts, but as a check to troops armed in the modern style, even without guns, it is insignificant itself.

The only spot I could find to encamp on here, was on a small patch of grass, immediately at the foot of the cliff on whose crest the fort was perched, and which towered up some hundred feet above us. Near us were encamped a party of shepherds from Choomoortee, who had just arrived to sell their wool and purchase grain. It is the custom among these people to give an order, while the crops are yet green and on the ground, for any amount of grain they may require, which when the crop is ripe, is stored up by the cultivator until the summer of the ensuing year, when the shepherd arrives with his flock, gives the wool in exchange, and receives his grain, which he puts into small bags, brought with him for that purpose, and drives his flock thus laden back into Chinese Tartary.

In the evening when the flock was brought back from pasture, I had an opportunity of witnessing the mode of shearing. The sheep whose fleece had been selected, were caught, thrown upon one side, and their legs bound together, when a shepherd having sharpened the long knife

which he carries at his waist, proceeded with expedition to strip off the wool, singing all the time, and joking with his comrades, who were likewise busily engaged around him. In a very short time the whole of the flock, save a few thin sheep, were sheared, and the wool being twisted into bundles, was carried up to the fort, to which also the next morning the sheep were driven, when having each received a load of from ten to twenty seers, they descended and took the road back to Choomoortee.

Soon after we had encamped, a scuffle took place between these shepherds and my Tartar guide from Leeo, and the latter at last came into camp with a fine fat looking sheep. I was at first inclined to look upon this as a daring highway robbery, but it soon appeared that in the previous year the guide had advanced the sum of five rupees to these shepherds for pushmeena wool, which they were to bring down for him, when they descended to the Rampore fair. This wool had been supplied in part only, and two rupees were consequently still due, for which the Tartar fearing lest he should be cheated, had seized the sheep in question. As the animal however with its fleece was worth more than double the sum required, the shepherds came and entered into an explanation, which seemed satisfactory to both parties, as the animal was restored. I laughed at the guide for being so easily pacified, and told him he would never get his money or his wool, but he replied quite confidently, that the shepherds had pledged their word, and therefore there was no fear, as a Chinese Tartar never broke his promise.

With the wool on these sheep are remarkably handsome animals, and have somewhat the appearance of the large English breeds, but when shorn, they present such a different picture with their long thin limbs and narrow carcase, that one would not know them to be the same animals.

They differ much, also, from the breeds of the lower hills, standing higher on their legs, and the horns wanting that solidity and strength which those of Kunawur possess. There is generally a black longitudinal stripe down the middle of the horn. I was anxious to purchase one or two of this breed, but the people very honestly assured me that they would not live below, on account of the dampness of the climate.

Most of these sheep were formerly purchased by the British Government by an agent appointed for that purpose at Kotgurh, but

from some cause or other it was not found to answer, and the speculation as abandoned I have been told that a difficulty existed in inducing the Tartars to sell to the British agent, they preferring to trade with the people of the higher tracts.

Whatever might have been the case in those days I know not, but at present I can confidently say, that the Tartars would gladly supply the Government with any amount they might require They will not, it is true, bring their flocks down, because the climate is unfavourable to them, and also because at the season of the Rampore fair the sheep which are sheared early in summer do not possess a full fleece The wool however which is cut in the beginning of the year, is sold by the Chinese shepherds to the Tartars of Hungrung and Spiti, and the traders from Kunawur, and it is these people who would supply the market if a demand were made for the wool, and who could procure it from above, in any quantity they chose to pay for

The failure is far more likely to have been caused by the avarice of the low country traders, who purchasing the wool cheaply above, and perhaps, as is often the case, intermixed with hairs,* dispose of it again at a rate so exorbitant as to prevent its yielding a remunerating price in the home markets of Europe

Had the agent instead of remaining in the lower hills paid an annual visit to Tartary, and purchased his wool directly from the shepherds themselves, instead of taking it from the hands of the traders, he would not only have procured a better, but a cheaper article

In case this wool should ever again become an article of speculation either to the Government or to individual enterprise, it may not be considered superfluous to offer here a few remarks on the method to be adopted in procuring it

In the first place I would warn the speculator against trusting to native agents, but would recommend him to make his purchases himself He would probably not be allowed to enter the country under the protection of China, but he might with ease and safety every summer repair to Hungrung or to Spiti, where the Chinese shepherds would not fail to meet him by appointment, and furnish any quantity of wool he might have ordered in the preceding year.

* Since this was written, I have been informed that such was actually the case, and that the wool was found to be so intimately mixed up with hairs as to render it unserviceable, without incurring a ruinous expense in cleaning it !!

It would be necessary therefore for him to make one trip in order to see the shepherds, and enter into arrangements with them for a supply to be delivered in the following summer at any Tartar station they might decide upon, and also to ascertain *what goods* they would require in return, for money, I imagine, would be held in less estimation than saleable and useful commodities.

Having made his arrangements, he would again in the following summer have to repair to the appointed place, where he would find the shepherds (as I did at Dunkur) ready with their flocks, and he would thus be able to select his own fleece, and see it shorn before him

It would therefore be his own fault if any hair or extraneous matter were received with it. Of this, however, as long as the wool did not pass through the hands of agents, there would be no fear, for it is those gentry who adulterate the article in order to increase its bulk, and so derive from the inexperienced trader a greater profit

The next point to be considered, is the carriage of the wool to the lower hills, and this indeed would be the chief expense

The method to be adopted, must be the same as that resorted to by the hill people themselves, which is, to load it on the backs of sheep and goats.

For this purpose it would be necessary to purchase a large flock, which during the winter season would find an abundant pasture in the lower tracts, or even in the plains, and in the summer and rainy season would be roaming over the grassy tracts of the upper hills

The first cost of these animals would be the chief expense, but even this would in the course of one or two seasons repay the outlay by the kids and lambs which would be produced, while something also would be recovered by the sale of the wool and ghee obtainable from the flock

With his flock therefore the speculator would transport to the Tartar districts, flour, grain, salt, iron, ghee, butter, cloth, sugar, and other articles in demand among the people, and for which, if his purchases were judiciously made either in the plains or lower hills, he might not uncommonly receive cent per cent on his outlay.

The profit thus made upon his own merchandise, would not only more than pay for his wool, but would even nearly, if not altogether, defray the expense of transporting it to the plains, and thus indeed when once the prime cost of his flock had been realised, the speculator might be said to receive his wool for nothing. From the profit arising

on his merchandise also, he would be enabled, should competition be feared from the present traders, to afford to take the wool at a higher rate than they can afford to do, and thus he could effectually drive them from the market, and establish a monopoly

The experiment is at all events worthy of another trial, since the former failure is entirely to be attributed to the inexperience of the agent, and the rascality of the traders who supplied him

On the following morning, having left behind me four people to receive supplies, I marched on towards Leedung, crossing the Lingtee river not far from Dunkur. A walk of about seven miles brought us to a miserable village of a few huts, which the guide told me was Leedung, so we halted for the night. After my tent was pitched, and the people had eaten their dinners, we all proceeded in search of fossils in the ravines and water-courses which came down from the heights along the river's bank. Here, however, nothing worth the trouble was found, but as I was searching at some distance from the rest of the party, a lad, whom I recognised as having been with the Dunkur commandant, came cautiously towards me, making signs that there was nothing to be had below, and then pointing to the palm of his hand, and looking towards the summit of the range of hills behind his village, he gave me to understand that for a reward he would lead me up the pass, where I should find something worth having. To this I readily agreed, and at once gave him a small red necklace to make the compact binding. He then in broken Hindostanee, and by signs, told me that I must keep to myself his having given this information, as the killadar had given orders that no one should show me the path up the heights. I afterwards discovered that he was an arrant cheat, and had taken me in with his story, as the killadar only alluded to the passes into Ladak, however I of course promised silence, and when he had pointed out the road, we parted, and I returned to my tent, when I gave orders to the coolies to be ready to accompany me up the heights the next morning.

About a quarter of a mile from Leedung is another small village called Larra. In speaking of either place the Tartars invariably apply the names of both, as Larra-Leedung. This custom is not however peculiar to Spiti, but prevails also in Kunawur when two villages are near each other, thus in Spiti we find Larra-Leedung and Chism-Kébur to be applied to the villages of Larra and Lee-

dung, and of Chism and Këburr, the two last being also on different banks of the river, and in Kunawur the names of Dabling-Doobling are always taken together, though they belong to different villages

The crops at Leedung were very poor and backward, and it is a great chance if they ripened before the snow fell again, the cultivation higher up the river too, is seldom ready for the reaper before the end of September, and is often wholly destroyed by an early fall of snow.

In the morning I started with about a dozen people up the mountain path, and after a toilsome ascent of 3,000 feet, reached the pass above Leedung. Beyond this was stretched a wide and undulating plain, shelving gradually to a stream far away in the distance, the pass and all the neighbouring hills were yet covered deeply in some places with snow, and the whole scene was one of cold and dreary solitude, with not a tree to intercept the view, nor ought of vegetation but the furze

Beyond the shelving tract of land which spread down from the ghat, arose again a mighty snow-clad range of hills lifting its hoary head to an elevation varying from fifteen to twenty thousand feet above the sea. Here on the summit of the pass, which is 15,200 feet, an extensive bed of decomposing shale gave a black and charred appearance to the soil, while high on either hand rose mural cliffs of brimstone interstratified with sandstones of different textures, these were splitting by the action of the frost, and falling in heavy masses down the ghat, where low down they formed vast beds of broken fragments of every size. Crossing this pass and descending along the shelving plain, we came, to my surprise, suddenly upon a village situated in the hollow formed by the undulating and blackened hillocks of shale which rose in all directions, looking like heaps of coals and cinders. Beyond this, the Tartar lad pointed to some dark ravines, or water-courses, where he said the fossils were to be found. Thither we of course repaired, but though we searched long and closely throughout the day, a few broken and useless specimens of the casts of Ammonites and Belemnites were all that we collected, and after wandering among the snows and swamps and muddy fields, at an elevation of 14,000 feet, from seven in the morning until 5 P. M., I returned weary and disheartened to the pass, from whence we again descended to our camp at Leedung.

Though puzzled to account for my want of success, I had nevertheless seen enough of the formation on the heights to feel convinced

that fossils must exist there, if they were really to be found in the Spiti valley, and I consequently determined to devote another day to a further search. Accordingly on the morrow I broke up my encampment, and repaired to the village we had seen on the heights above Leedung, among the regions of snow. Having now plenty of time to look about me, I commenced a closer search in the bed of a snow stream, which had scooped a narrow channel through the decomposing shales. Here I was soon rejoiced to find that I had at last "hit the nail upon the head," and a large supply of *Belemnites* rewarded me for wading ankle deep up the chilly stream. Along with these a few broken *Ammonites* were also found, and a species of bivalve shell, which the Tartars termed "puthur ka muchlee," or fossil fish.

From this place, which was elevated 15,250 feet above the level of the sea, and covered here and there with beds of snow, I proceeded, after several hours search, to the village about a mile farther down, where my tent was pitched and my people had all arrived.

The following day was again devoted to a search for more and better specimens in various directions, but to very little purpose, and seeing now no prospect of obtaining more, and being unable from the depth of snow to search the lake of Chumor-ra-reel, now only three days journey from us, I was reluctantly compelled to give the order to retreat, for our provisions had dwindled to one day's supply, and there was here no prospect of procuring more for love or money.

The village at which we had encamped was called "Gewmil," and had an elevation of 14,104 feet, yet here, in spite of reviewers and reviews, surrounded in the month of June by deep and extensive beds of snow, a fine and healthy tract of cultivation smiled, like "some bright emerald midst the desert waste." At this season, however, the wheat and barley was barely six inches above the ground, and from the elevation of the tract, it seldom ripens before the first days of October. The hills around it on every side are clothed to their summits with the Chinese furze (*Astragalus* of Royle) which notwithstanding the advanced season of the year, had scarcely put forth a single leaf. This backwardness was however somewhat unusual, and was owing to the lateness of the last fall of snow, which throughout the upper parts both of Kunawur and Spiti, had fallen two months later in the season than is generally experienced; so heavy indeed was the snow still lying on many of the higher passes, that it is more than

probable they could not have been free from it, or open to travellers before the fresh autumnal falls occurred *

The season of 1837, which in the Provinces, from want of rain, brought sickness and scarcity upon the inhabitants, was also a time of trial and misery to the poor Spiti Tartars, inhabiting the villages beyond the fort of Dunkur. It was, however, not the want, but the excess of rain, a thing so unusual in those parts, which caused the failure of their crops, by rotting them on the ground, and the little that escaped this scourge, and which would eventually have ripened, was cut off so early as the month of August by a heavy fall of snow which crushed and beat down the grain, and rendered it useless. At the time therefore when I visited those parts, so far from being able to furnish me with supplies, the wretched people were actually reduced, like beasts of the field, to seek for herbs and wild roots with which to satisfy the cravings of hunger, and they were rendered almost frantic with delight by the gift of a handful of meal, which, though straitened as we were ourselves, it would have been inhuman to deny them. Many have been obliged to leave their homes and go as labourers to Ladak, who were lately in possession of cultivated lands.

This, it would appear, is by no means an uncommon occurrence in the higher portions of the valley, for the people in speaking of the quantity of grain likely to be gathered from their fields, always put in the proviso, "if the snow does not fall early."

Around the village of Gewmil, many ponds are found for the reception of the snow water, from which the daily quantity requisite for the irrigation of the crops is supplied. On one of these, at this enormous height, were a pair of Brahminnee ducks, which had fled from the summer heats of the Gangetic Provinces to revel in the cool and secluded retreats afforded on the snowy heights of Tartary.

Here, too, among the frowning cliffs, the raven and the vulture-eagle were seen, as also the red-legged and yellow-billed choughs.

From one of the peaks, behind this village, which attained the height of 14,714 feet, I beheld the course of the Spiti river, winding its way for miles along the valley, until it was lost in a turn of the mountains. From this spot I looked down upon the village of Larra, whose houses and cultivation showed like mere specks, when seen from a perpendicular height of 2,700 feet.

* This proved to be the case, as the Tartars could not descend to the Rampore fair

Viewed from this elevated station also, the majestic grandeur of the neighbouring hills, which enclose the river like two lofty walls, sink into comparative insignificance, and appear with their snow-capped summits like so many glittering pyramids of sugar; yet they attain to an elevation above the sea of seventeen to twenty thousand feet, and their hoary and time-scarred heads are crowned by everlasting and unfading snows

It had been my earnest wish to cross the mighty Pralassa range of mountains, from whose snows the Spiti river is supplied, and to visit the beautiful and extensive lake of Chummor-ra-reel, of which Gerard speaks, but from the unusual depth of snow over all the passes, I found this to be impossible, for although I had plenty of time before me, and could have waited till the thaws had commenced, yet the chance that before they could be crossed the autumnal falls would again commence, added to the total impossibility of obtaining provisions for my people, rendered it necessary that I should beat a speedy retreat from the inhospitable valley, and thus I was reluctantly obliged to quit the district without having accomplished one of the most wished for objects of my journey

This lake is said by Gerard to abound with fish, and to be covered in the summer months by flocks of ducks, geese, and other water-fowl, which resort there from the heats of the Provinces. From Puttee Ram and others who have often visited the spot, I heard that its waters were salt, and could not be drank, as they acted like medicine, so that travellers and the wandering Tartar shepherds who sometimes inhabit the borders of the Lake in their black tents of blanket, are obliged to use the water of the snow streams and springs in its neighbourhood.

From these facts an interesting subject of inquiry arises; namely, whence did this Lake, situated at an elevation of at least 16,000 feet above the sea and surrounded by hills, whose summits are usually capped with snow throughout the year, derive the fish with which it is now stocked? Are they identical with the species common to our rivers of the Gangetic Provinces, or are they distinct and peculiar to the Lake itself?

Doubtless there are many who will infer that they are identical with the species of the Provinces, and that the Lake being the summer resort of water-fowl, the ova have been deposited in its waters through their agency. But to this opinion I feel decidedly averse, from the

fact, that such a sudden transfer of the ova of species belonging to hot climates, to the waters of a lake which is elevated so far above the natural abode of the species, and which are often *ice bound* for several months in the year, would render the ova thus transported totally unfruitful, and that the climate of these regions is totally different from that of the plains, is a fact which is fully established by the migration of birds to them during the summer season

Again, those birds may resort there from the plains of China, as well as from those of Hindoostan, and as it is equally probable that ova would have been brought from both countries, we should find species of fish peculiar to either country, not only being together in the same climate, but in a climate which differs widely from the natural habitat of all the species.

Moreover, I question whether the ova *could* have been brought from the plains of either country, because the birds by whose agency the waters should have been stocked, quit the rivers of the plains, and resort to those high regions in order to *avoid* the hot season in which the ova are *produced*; therefore the ova could not have been brought by them

If, again, the lake was stocked with fish through the agency of the water fowl which resort to it, how is it that the smaller lakes and ponds have not been similarly stocked also, for both at Nako in Hungrung, and at Gewmil on the heights of Spiti, I observed the Brahminee duck, so common in the plains of India, yet the ponds at those places do not contain a single fish?

But as the birds do not arrive at the lake in question, in the course of one or even two days, but make various halts in their journey from the plains, it is at once apparent, that the undigested ova which they are supposed to have brought with them, should have been voided rather in the ponds of the intermediate stages, than in the waters of these stupendous regions

But the most decided proof, perhaps, that this lake was not stocked from the rivers of the plains by the agency of birds, exists in the fact that its waters are *salt*, and strongly impregnated with borax, consequently the ova of species adapted for an existence in pure fresh rivers and ponds, could not have been productive in regions and waters decidedly inimical to their constitutions

The question however, is one of some moment, and worthy of being fully sifted. I am myself inclined to believe, as will be more fully seen

hereafter in my geological notice of the Spiti valley, that those species may be peculiar to the lake or lakes of those lofty regions, and that they date their existence from the period when those waters first became adapted to support the species which now inhabit them, and that date I fix as *posterior* to the Mosaic Deluge, when, as I shall hereafter have occasion to notice at some length,* the Himalayan ranges were first upheaved, and many climates were called into existence, requiring new creations to inhabit them, as they themselves were new

It was for the purpose of endeavouring to elucidate this point, that I felt so anxious to obtain a passage to the Lake Chummor-ra-reel, and my disappointment may therefore be conceived, when I found the pass impracticable from the unusual depth of snow which had fallen so late in the season as the month of April, and which indeed fell again, as I witnessed, for three successive days, during the latter end of June, even so low down as Pokh in the bottom of the valley

The clearing up of these doubts is a subject well worthy the serious attention of any naturalist who may have the means and the inclination to visit the lake in question

On the 23d of June, we proceeded once more towards Dunkur by a most precipitous path, which wound backwards and forwards on the side of the hill in such a zig-zag manner that we were almost in a line one above another. The loose nature of the gravelly soil by no means added either to our comfort or safety, for those behind were continually showering down volleys of dust and stones upon the heads of those who were below. This descent at length brought us to the side of a brawling stream, whose waters were dashing over the precipitous rocks with headlong violence in their passage to join the Lingtee river, many hundred feet below us. At the very place where this stream was the most violent, and where it fell over the rocks in a long sheet of foam, a faint shout of many voices reached my ear above the hoarse roar of the cataract, and looking upwards, I beheld to my horror and dismay, a large fragment of rock, rolling down the side of the hill directly upon me. So hampered was I for room, with the steep crumbling hill on the one hand, and the deep chasm on the other, that I should undoubtedly have stuck fast to await the coming blow, had not a Tartar near me, with more presence of mind than gentleness, pulled me flat on my back and allowed the fragment to fly pass us into

* A Theory of the Earth

the stream On inquiry, it appeared that the rock had been displaced by a goat which I had that morning bought for my people, and which being refractory, a man was hauling along by a rope round its horns, and thus in the resistance and scramble of its feet it had nearly made me pay dear for my generosity A few miles farther on brought us down to the Sangho, across the Lینگtee, and on the road to Dunkur, where after a hot walk of about eight miles we halted for the night

It is perhaps sometimes as well for us that we cannot lift the curtain and peep behind the screens, or we should leave many things undone that our ignorance of coming events prompts us to undertake, and thus it was with me, for had I been at all aware of the fatigues and discomforts which awaited me, I do not think that even my love of science would have tempted me into those bare and chilling scenes

To describe the numerous shifts and annoyances that a traveller meets with, would be but labour lost, and after all, from him who is snugly ensconced "in his ain ingle neuk," or comfortable parlour, these would but elicit a smile, and therefore it is useless to enlarge upon them, as they must be felt, ere they can be fully appreciated Not the least of them however is the following, every inch of level ground that can be rendered available is cultivated, and it often happens that the only spot the traveller can find on which to pitch his tent, is one on which, to judge from the deep accumulations of their dung, large flocks of sheep and goats have been folded since the days of the good old patriarch Abraham Here then "the weary and way-worn traveller" is necessitated to pass a night of sleepless wretchedness, stifled by the stench which arises in almost perceptible fumes from the ground, and devoured by the myriads of fleas whose irritating bite effectually banishes the overtures of that sleep which is so necessary to furnish strength to meet the labours of the morning's march

Often have I been reduced to banquet on a goat which might, for ought I know to the contrary, have been as aged as myself, and the father of a goodly progeny, strong, tough, and sinewy, as well could be; yet hunger is the best sauce, and bad as I might have thought such fare, when better was procurable, I nevertheless have managed to make a hearty meal off "sinewy Billy" and barley cakes, and blessed my stars that matters were no worse.

To recount the incidents of each day as I retraced my steps through Spiti to Ilungrung and Kunawur, would be merely to repeat what has

already been written, and it will therefore suffice to say, that the same streams were waded through, and the same broken and rocky paths were traversed, till we again arrived in safety at the village of Chungo. Having halted here a couple of days to refresh my people, and also to procure specimens of the wild sheep, which abound in the neighbouring cliffs, I once more started with the intention of going to Leeo, but the Vuzeer Puttee Ram, who was now on his way back to Soongnum from the fort of Skialkur, where he had been to inspect the store of arms &c., advised me to take a passing peep at Nako, which he described as a nice cool halting place. I therefore changed my plans and marched to Nako on the heights above Leeo, Puttee Ram sending me a Ghoont to carry me up the hill. The road for the greater part of the way was the same as I had travelled over from Leeo to Chungo, when on my upward journey to Spiti, it was so stony and rugged, that I preferred trusting to my own legs rather than to those of the Ghoont, in spite of the people's assurance that he would carry me safely. The village of Nako, like all the others of these regions, is a collection of small dirty huts, with flat roofs, and built of unbaked bricks of large size, intermingled with slabs of stone, or usually, as in Spiti, of stone for the foundation, and of bricks above. There is a good deal of cultivation about it, and water is plentiful. There is a small pond of good depth near the village, on which were several Brahminee ducks.

The village boasts of two or three takoordwaras, or Lama temples, which contain a few very badly formed clay images of their gods. The people have no objection to a traveller entering their temples, which is a great convenience, as I found more than once when my tent was in the rear, after a long march. At Nako I took possession of one of them, which afforded me a cool retreat during the heat of the day.

The walls of these temples are usually daubed over on the outside with red, whilst on the inside they are painted with numerous grotesque figures of gods, men, and animals; they are generally square built, and contain one room.

The largest of the kind I saw during my journey was at the village of Tabo in Spiti, where there are three or four rooms all decorated with figures. This temple is the largest in the district, and is consequently the head quarters of the Lamas. It contains an immense collection of manuscripts, which are said to contain all the mysteries of

the Lama religion, and on certain occasions are read to all who are willing to listen. There was besides the larger rooms of images, an inner apartment in which a small lamp was burning, and into which I was requested not to set my unhallowed foot, as none but the priests themselves were allowed, except *à la distance* ! to inspect what was within. It contained a small altar, placed before a god, with a brazen lamp burning on it, there were also brazen utensils of all sorts and sizes, musical instruments, such as tom-toms and cymbals and a quantity of raw ribs of meat, apparently of mutton, with which, like the jolly friars of olden times, no doubt they were wont to regale themselves.

There are a few Lamas resident at Nako, where they are zemindars. They occasionally receive presents from the brotherhood in China, of small carpets, tea cups, pieces of silk, &c. One of these men coming to pay me a visit and to show all the curious things in his possession, doubtless with a view to tempt me to become a purchaser, the conversation by some chance turned upon the subject of how Lamas were made, and who could become one. He said there were no really good Lamas either in Hungrung or Spiti, as it had become somewhat customary to make a Lama of any wealthy zemindar, who happened to have a family, while properly speaking no Lama, should either marry or have children.

I asked him if I could be made a Lama, to which he replied there could be no objection provided I would study for some months among them, and be initiated into the mysteries of their religion, with regard to the resurrection or reappearance of the Grand Lama after death. We did not get on very satisfactorily, as the Kunawurrees who were standing by, burst into a loud laugh at my explanation of the case, which displeased the Lama and made him drop the subject.

It seems however from what he said, that when a Grand Lama dies, an inventory is made of all his effects, which are carefully sealed up until his reappearance in life to claim them.

In explanation whereof, he said, suppose a Grand Lama were to die in Chinese Tartary, his effects would be carefully guarded,—some time afterwards perhaps he might appear at Nako in Hungrung, in the form of some Lama's child.

This is known to be the new Grand Lama, from his laying claim to the sealed up effects of the deceased Grand Lama. He is then

asked what those effects consist of, and where they are?—and he accordingly states them one after another

This is sometimes deemed sufficient proof, but if doubts still remain, the effects of the deceased are brought and *mixed* with other things, and the young aspirant is desired to show what are his, and what are not.

If further proof be still necessary, the child is desired to give some token that he is the Grand Lama, which he does by commanding them to carry him to some spot which he points out, and there he places his hand or his foot on a rock or large stone; when—“*mirabile dictu*,”—if the spirit of the Lama be really within him, the impression remains indented upon the rock !

This is deemed conclusive, as well it might be, and the urchin is at once proclaimed Grand Lama, presents are showered upon him from all quarters far and near, and he is carefully instructed in the rites and mysteries of his religion, and in due time proceeds to his head quarters in Chinese Tartary.

Among the rocks, but chiefly on the crumbling accumulations of debris in the neighbourhood of Nako, and even at Chungo, there is a plant found whose root is long and strikes perpendicularly downwards to some depth, the outer coat or fibres of which produce a rich and beautiful crimson dye. It is said however to be fugitive, but this may arise from ignorance of any chemical mode of fixing it. It is used by the Lamas to stain their images. The Tartars call it “*khamé*.” Behind Nako, at some distance, rises the mighty mountain called in the language of the country “*Purgule*,” and towering aloft to a height which exceeds 20,000 feet. It derives its name from its form, the word signifying “cone-shaped or conical,” hence it is applied, like the term “*Kylass*,” to any mountain of that form.

From Nako I proceeded a short down hill march to Leeo, which is situated in the bed of the valley below, at a depth of 3,000 feet. The day was excessively hot at this place, which is completely shut in by hills rising on every side to the height of seven and eight thousand feet above it. Its crops of barley, wheat, and peas, were beautifully rich and luxuriant, and the numerous apricot trees were loaded with fruit, though as yet small and unripe. The grain is reaped at this village towards the latter end of July and beginning of August. In the district of Spiti the harvest takes place in the lower and more sheltered

situations, such as Larree, Pokh, Maness, and Dunkur, in the month of August, while in the upper parts of the valley, at Larra, Leedung, Keeoling, and Gewmil, on the heights, the grain is never ripe before the end of September and beginning of October. At the last named village it is ready about fifteen days later than at the others, which are situated on the river's banks, as might be expected from the difference in elevation, the village of Gewmil being at a height of 14,104 feet above the sea, while the others are from 12,200 to 12,500 feet.

Last year, in the month of August, the snow fell so heavily at Gewmil, that the whole crop was beaten down and destroyed. This present year of 1838, towards the end of June, the crops though healthy looking, were not more than four or five inches above the ground. It is surprising however to see with what rapidity the vegetation of the upper hills is brought to maturity. When I arrived early in June at Hungo, Leeo, and Chungo in Hungrung, their crops of barley and wheat were not more than six or seven inches in height, while on my return, three weeks afterwards, they were all in full ear, and would be ready for the reaper in July. This however is scarcely to be wondered at, when we notice the difference of temperature in that short space of time —

At Hungo, elevation 11,413 feet by boiling point,

	<i>Sunrise</i>	<i>Noon</i>	<i>Sunset</i>
10th June	41°	85°	60°
3rd July	60°	96°	64°
Difference in 23 days	19°	11	4

At Leeo, elevation 9,362 feet by boiling point,

	<i>Sunrise</i>	<i>Noon</i>	<i>Sunset</i>
11th June	45°	100°	50°
2nd July	56°	110°	70°
Difference in 22 days	11	10	20

At Chungo, elevation 9,897 feet, boiling point,

	<i>Sunrise</i>	<i>Noon</i>	<i>Sunset</i>
12th June	35°	82°	56°
29th June	48°	90°	69°
Difference in 17 days	12°	8	13

(*To be continued.*)

Zoological Catalogue of the Museum of the Asiatic Society —By
J T PEARSON, Esq

To H TORRENS, Esq

Secretary to the Asiatic Society

SIR,

When Curator of the Asiatic Society, I wished to make a catalogue of that portion of the Museum—the Zoological, which was my particular charge,* and to this end got ready a good number of notes, and began to prepare the catalogue, my departure from Calcutta, and afterwards other circumstances, obliged me to put off copying and correcting it. And at last I found, that not only had my arrangement of the Museum been overthrown, but the labels I had attached to the specimens were displaced, probably by some rough treatment. Under these circumstances, my intention of publishing my notes was almost laid aside, but as they may be useful when the Society shall have got a Curator, by saving him a great deal of labour, and as the labels of the osteological specimens were written in ink, they, at all events, could not have fallen off, I have the pleasure of placing a portion of the catalogue at the disposal of the Society, the remainder shall follow as soon as I can prepare it.

In the introductory remarks, I have explained the principles upon which I think such a catalogue should be made. I have therefore nothing to add upon that subject, but as a member of the Society, I must deprecate the changes and innovations in the classification of the objects in the Museum, which I understand to have been made. If every successive Curator be allowed to alter the arrangement at his

* I mention this, because blame has been cast upon former Curators, for their inattention to the Geological and Mineralogical portions of the Museum. Lest it should be thought just to myself, I distinctly state, that I never took charge of more than the *Zoological* portion of the Museum, Mr J Prinsep having had the Geological and Mineralogical specimens under his own care. and I must say it will take much better evidence, than any yet brought forward, to make me believe he neglected them in any way, much less to justify the hue and cry that has been raised about them. The confusion spoken of by the Committee of Papers in their late Curatorship report, has probably arisen since he was compelled by his much to be lamented illness to retire from the country, or from innovations which are better calculated for display, than for improvement.

own will, it will be impossible ever to prepare a catalogue to refer to the specimens, and be highly injurious to the institution. The changes made in the system of classification of the birds, by changing that of Vigors for that of Cuvier, are, so far as I can understand, hardly judicious, and I have yet to learn, that the makers are safer guides in ornithology than Vigors and Horsfield

I have the honor to be,

Sir,

Your most obedient humble servant,

J T PEARSON,

Member Asiatic Society.

DARJEELING,
11th June, 1840.

Some difficulty was experienced in making a catalogue of the specimens in the Museum of the Asiatic Society previously to the year 1835, owing to there being, in many instances, no record either of the specimens themselves, or of their donors, whenever the name of the latter could be found out, it is given, and in future each specimen should be carefully registered, immediately it is received

In forming a catalogue of a daily increasing Museum, it is evident it cannot be a systematic one. A numerical plan therefore is adopted, in which the specimens are numbered according to the order in which they come before the Curator. In the cabinet, however, a systematic arrangement of the specimens will, as nearly as possible be followed, and upon each a number placed, referring to the same number in the catalogue. Thus the catalogue will be numerical, the arrangement systematic

But should it be thought desirable, the Curator can, in each successive edition, add a list of the specimens, arranged according to the system or method followed, as an Appendix

The general system of classification adopted, is that of "La Regné Animal," on account of its being at present that most in use. But particular branches of Zoology will be classified according to the system best adapted to the present state of the science. In Birds, the classification of Mr. Vigors will be followed, in Insects and Crustacea, that of Latreille, in Mollusca, that of Lamarck, and in Mammalia, Reptiles, and Fishes, that of Cuvier himself

OSTEOLOGY

- No. 1. } CLASS. Mammalia—ORD. Carnassiers—FAM. Carnivora—
 2. } TRIBE. Digitigrades—GEN Felis
 3. }
 4. } SP F. tigris—The Tiger
 5. }
 6. }

A Skull.

Among the lists of donations to the Museum, many specimens of Tigers' skulls are mentioned, but there is no record as to the donors, of any particular specimen

- No 7 Felis leopardus.—The Leopard

A Skull

- No. 8 GEN Hyæna

SP. H vulgaris.—The Striped Hyæna

A Skull

- No 9. GEN. Felis

SP. F. kutas (?) The Kutas

A Skull.

There is some doubt as to this specimen, but it is believed to belong to the animal described under the above name, by Mr J T Pearson, in the Journal of the Asiatic Society, vol 1

- No. 10 F. catus The Domestic Cat

A Skull.

- No. 11. } GEN. Canis

12 } SP. C. Lupus The Wolf.

14. } *A Skull.*

Mr. G. T Lushington is mentioned in the Journal As Society, vol. iv. p 56, as having presented a series of skulls, among which were three of the Wolf

- No 13 }
 15 } Canis familiaris The Dog.
 16 } *A Skull*
 17 }

- No. 18. GEN. Viverra

SP Viverra. —

A Skull.

- No 19 ORD Quadrumana—FAM Simiadae—GEN. Semnopithecus.

SP S entellus. The Entellus Monkey.

A Skull

The common long tailed, black-faced, black-handed Monkey of Bengal, Behar, and Orissa

No 20 ORD Carnassiers — FAM Carnivora — TRIBE Plantigrades
GEN Ursus

SP. U labiatus (?) The long lipped Bear (?)

A Skull

No 21 } ORD Marsupialia — GEN Kangurus
22 } SP K — ? The Kangaroo

A Skull

I am uncertain as to the species, and prefer to leave a blank, (which may be filled up hereafter) to the chance of a wrong designation A cranium of a Kangaroo is stated in the 12th vol. Researches As. Soc to have been presented by Dr. Wallich, probably one of the above

No 23 ORD Pachydermata — GEN Tapirus

SP T Malayanus The Malacca or Indian Tapir

A Skull

Major Farquhar sent this specimen to the Secretary in 1816, and his paper upon the Malacca Tapir appeared in the 13th volume of the Researches, 1820 Sir S T Raffles has since discovered the same animal in the forests of Sumatra, and Sir E Home has given a short notice upon the comparative anatomy of the Tapir of Sumatra, which was read before the Royal Society on the 22d March, 1821, and published in the cxi. vol of the Philosophical Transactions

These dates are given, because a discussion has been carried on between some English and French naturalists, as to the discovery of the Malacca Tapir. The latter stating that it was discovered by Mr. Diard, and the former by the donor of this specimen

The present specimen has an additional interest, from its being the first that brought the Malayan Tapir to the notice of the naturalist

No 24 ORD Cetacea — FAM Sirenia — GEN Halicore

SP H Indica. The Dugong

A Skull and part of the Vertebrae.

This specimen was either presented by Major Farquharson, or Dr Tytler, I am uncertain which. In the paper in the Philosophical Trans.

actions, by Sir E. Home, mentioned under the last specimen, the author has instituted a comparison between the Lamintin and the Dugong, or Duzong. A matter which was settled long before in the "Annales du Museum d'Histoire Naturelle"

No. 25. FAM. Cete.—GEN Delphinus

SP D Gangeticus The Gangetic Dolphin.

A Skull

The Gangetic Dolphin is the *Platanista Gangetica*, of Hardwicke and Gray

No 26 SP Delphinus delphis —The Porpoise

A Skull

In the 12th vol of the Researches As Society, mention is made of a presentation by Dr Wallich, of the cranium of a "Dolphin, found near the Isle of France"

No. 27 ORD Pachydermata

28 GEN Rhinoceros

29 SP R Indicus The Indian Rhinoceros

30

A Skull

Dr Wallich presented *five* crania of the Rhinoceros, see Researches vol 12

No 31 SP Rhinoceros Indicus The Indian Rhinoceros

An articulated Skeleton

This specimen was shot at Baugundee, in Jessore, by Mr J H Barlow, and presented in his name to the Society, 1834

No. 32 FAM Proboscidea

33 GEN Elephas.

34 SP E Indicus

A Skull

Nos. 32 and 33 were presented by Dr Wallich, (see Researches vol. 12) the latter being a divided skull. No 34, a fine specimen, was presented by the late Dr J. Adam

The old trivial name for this species has been, for some reason or other, changed into that of "Asiaticus," a name less definite even than that of Indicus; and not, like it, recommended by time and classical recollections

No 35 GEN. *Sus*
 SP *S scrofa* The Hog
 A Skull

No. 36 } *Sus babyrussa* — The Babyroussa
 37. } *A Skull*

Crania of the Babyroussa are mentioned in the list of donations in the 12th vol. of the Researches, as presented by J Dunlop, Esq., and Dr Wallich

No. 38 ORD. Carnassiers
 FAM Carnivora
 TRIB. Digitigrades
 GEN Canis.
 SP *C lupus* The Wolf
 A Skull

Presented by G. T Lushington, Esquire

No. 39 SP *Canis familiaris* The Dog
 A Skull

No 40 ORD Rodentia
 GEN *Lepus*
 SP *L cuniculus* The Rabbit
 A Skull

It is well known that the teeth of animals of this genus are subject to an extraordinary growth of the incisor teeth. In the present specimen, this is carried to excess, for not only are the incisors, above and below, enormously lengthened, but the molar, or cheek teeth, also partake of it, particularly the two anterior ones in the upper jaw, which are much larger than any of the rest (though all are long) and curved outwards, as if making their way through the cheek.

No 41 } ORD Ruminanta
 42. } TRIB Capridæ
 43. } GEN Antelope
 44. } SP *A cervicapra* The common Antelope
 45. } *A Skull and Horns*

No 46 SP *Antelope leucoryx.* The White Oryx
 A Skull and Horns

Major Hamilton Smith states the *Antelope leucoryx* to be the true Oryx of Appian, the Antholops of Eustathius, and the great Goat of

the Shah Nameh, it is said to be common in Bahrein, and along the coasts of the Persian Gulf, and also on the western side of the Indus, as far as Candahar

No 47 SUB-GENUS *Damalis*

Sr *D. caama* The Caama.

Horns and part of the Skull

Presented by R. Home, Esq, if this is the specimen put down in the list of donations to the Museum in the 12th volume of the Researches as "a skull of the Cape Antelope" The animal named by the Caffers, Caama, is the Harte beast of the colonists, and the Cervine Antelope of Pennant and Shaw

No. 48 GEN *Antelope*

Sr *A Thar* The Thar Antelope,

Horns and part of the Skull

No. 49 *Horns of the last species*

No 50 *A horn of the Thar Antelope (?)*

This horn differs from the preceding in being more robust, more gradually tapering, not so sharp at the point, not transversely wrinkled so far down, nor so much wrinkled longitudinally, as they are, and in the rings being more numerous, and better defined than in them. These differences are so marked as to lead to a doubt, if the two are of the same species.

No 51. } Sr *Antelope?*

52 } *Skull and Horns*

53 } There are three skulls, and some detached horns of
54. } this species in the Museum They were presented by Mr

55 } G. T Lushington, and came, it appears, from the neighbourhood of Bhurtpore. The species is unknown to me, and perhaps is a new one

The last specimen (No 55) has the horns apparently distorted, being more lyrated, and more bent inward at the tips, than the others

No. 56 } Sr. *Antelope chiru.*—The Chiru

57. } *Horns of the Chiru*

58 } Presented by Lieut Robison The Chiru, or Unicorn as
59 } it is still absurdly called, is by some supposed to be the
60 } Kemas of Elhan All the specimens (except No 56. which appear to be a pair) are odd horns, or of unequal length.

- No 61 } SP Antelope cervicapra—The common Antelope.
 62 } *Horns of the common Antelope.*

- No 63 }
 65 } SP Antelope ———— '
 66 } *Polished Horns of an Antelope*

- No. 64 SP Antelope ———— ?
A single Horn

Species similar to No 51, but horn more bent backwards.

- No 67 SP Antelope guoral—The Ghoral Antelope.
A Skull and Horns of the male

Presented by Lieut Vicary, 4th Regt N I

- No. 68 SP Antelope guoral—The Ghoral Antelope
A Skull and Horns of the female

Presented by Lieut Vicary

- No 69 SP Antelope cervicapra—The common Antelope
A Skull and Horns

Presented by Lieut Vicary

- No. 70 SP Antelope churu—The Chiru
A single Horn

- No 71 SP Antelope ———— ?
A Skull and Horns

Another specimen of the species mentioned under No 51.

- No. 72. GEN. Capra
 SP. C Jemlahica—The Jemlah Goat.
Horns and part of the Skull

- No 73. } GEN Ovis
 No 74. } SP O Argali—The Argali
Horns and part of the Skull.

The Ovis Argali is the O Ammon of many modern naturalists. The O Pygargus is also called Argali

No. 74 has a larger portion of the skull attached to the horns, than the other has, it was presented by Mr. W. B. Bayley, see Researches, vol. 13.

No. 75 **SP** *Ovis aries* The common Sheep
Part of the Skull and Horns of an Indian variety of the common Sheep

No 76 **GEN** *Damalis*
SP *D Strepsiceros*—The Koordoo.
A single Horn.

No. 77 **GEN** *Bos*
SP *B taurus* '
Part of the Skull and Horns

No. 78 **SP.** *Bos gour* The Gour
Horns and part of the Skull

Major General Hardwicke has well described the horns of the Gour in the Zoological Journal, vol 3 p 231 His description is accompanied by a plate

No 79. }
SP *Bos bubalus* The Buffalo, Indian variety
Skull and Horns

No 79 was presented by Lieut R C Nuthall

No. 83 **SP** *Bos gour* The Gour.
A pair of polished Horns

Presented by Mr G Dowdeswell, see Researches, vol xii

No 84 } **SP** *Bos*————— '
85 } *Polished Horns of a species of Bos, perhaps of the Gour*

No 86 } **SP** *Bos bubalus* The Buffalo
87 } *Horns of the Buffalo, Indian variety*
88 } No 87 is polished

No 89 **GEN** *Ovis*
SP *O aries* The common Sheep
A pair of Horns

No 90 **GEN** *Cervus*
SP *C Wallichia* The Nepaul Deer
A pair of Horns

These horns were perhaps cast by the specimen of Nepaul Deer brought from that country by Dr. Wallich, our esteemed Vice-President, in whose honour the species was named

- No 91. }
 92 } Sp Cervus Bara-Singha The twelve antlered Deer
 93. } *A Skull and Horns*

The present species is the Bara-Singha, or twelve antlered Deer of Indian sportsmen The species is, perhaps, as I have assumed it to be, new to science, and it seems to be intermediate between the Elaphine and Rusa groups The bifurcation, and rebifurcation of the horns, with the single antler below, is somewhat similar to that of the Cervus macrotis of the North-west of the United States, but in other respects the horns differ

No 94 Sp Cervus ————

A pair of Horns

A pair of distorted horns, according to a label attached to them, "cast by the Elk at Allipore, 15th February, 1833, W Bell" What the animal here called an Elk really was, is doubtful, especially as the horns are distorted They appear like those of the Bara-Singha.

- No 95 } Sp Cervus porcinus The Hog Deer.
 96 } *Horns and part of the Skull*
 No. 96 a pair of Horns.

- No. 97 } Sp Cervus ————
 98 } *A pair of Horns, distorted, probably cast by a Deer kept in confinement*

No 99 Sp Cervus pocinus The Hog Deer

A single Horn

- No 100 } Sp Cervus axis The spotted Axis Deer
 101 } *Horns of the Axis*

The pair No 101, covered with the skin

- No 102 } Sp Cervus hippelaphus The great Rusa Deer
 103 } *Skull and Horns*
 No 103 Horns only, but covered with skin

In Griffith's Synopsis, the name of Baren-Singha (Bara Singha perhaps) is given as a Hindi synonym of this Deer, but it is evidently a mistake, for, in India it is called Saumer, and there are two Deer so called, which differ much from each other, one black, the other red, and the latter much larger than the former. The present species is the great Axis of Pennant,

No. 104. SP. *Aristotelis*. The black Saumer, or Rusa Deer.

Horns and part of the Skull

No. 105 SP *Cervus hippelaphus* (?) The great Rusa Deer (?)

A single Horn

No. 106. SP *Cervus muntjak* The Khyjang

Horns and part of the Skull

No. 107 SP *Cervus hippelaphus*. The great Rusa Deer

A single Horn

No 108 SP *Cervus aristotelis* The black Saumer or Rusa Deer

A single horn

No 109 ORD *Pachydermata*

GEN *Eguus*

SP *E caballus* The Horse

A Skull

No 110. GEN *Rhinoceros*

SP *R. Indicus*. The Rhinoceros

An articulated right hind foot the os calcis mutilated

No 111 GEN *Elephas*

SP *E Indicus* The Indian elephant

A Scapula

No 112 ORD *Carnassiers*

FAM *Marsupiatia*

GEN. *Thylacynus*

SP *T cynocephalus* Van Diemen's Land Tiger

A Skull

This specimen was taken from a stuffed skin presented by Dr J Henderson The dentition of the species having been incorrectly given heretofore, I described it as accurately as the state of the present specimen would admit of (the incisors being wanting) in the 4th vol of the Journal of the Asiatic Society, page 572 But since my description was written (and in consequence of its having been written) another specimen has been presented to the Society; and it is to be desired that some competent person should describe the position of the incisor teeth from it I have reason to doubt the accuracy of my conjecture, formed as it was, from the empty sockets only

- No. 113 ORD Cetacei
 •FAM Cete.
 GEN Monodon.
 SP M monoceros The Narwhal

A Tusk

Presented by Captain Lumsden see Researches, vol xiv

- No. 114 } CLASS Reptilia

115. } ORD Sauria

GEN Gavialis

SP G. gangeticus The Gangetic Gavial or Guryal

Skulls of the Guryal Alligator

- No 116 } GEN Crocodilus

- 117 } SP C biporcatus The Indian Crocodile

Large skulls, the former covered by the skin. Of these specimens, the former was presented by Mr M Cheese, and the latter by Dr Wallich see Researches As Soc vol xii

It has been supposed that there are two species of the Indian Crocodile, but so far as I know, nobody has yet been able to distinguish correctly between them I have discovered, however, what I consider to be undoubted signs —viz *the cranium of the one has ONE TOOTH MORE than the other, and is much broader in proportion* Several specimens in the Society's Museum, shew this

- No 118 CLASS Mammalia
 ORD Ruminantia
 GEN Capra
 SP C hircus—The Domestic Goat

A Skull and Horns

- No 119 GEN Ovis
 SP O aries. The common Sheep

A Skull and Horns

- No 120 ORD Pachydermata
 GEN Hippopotamus
 SP H. amphibius—The Hippopotamus

A Tusk

- No 121. ORD Quadrumana.
 GEN Simia
 SP S. gigantea The Gigantic Ape

The lower Jaw

The lower jaw of the Gigantic Ape shot by Captain Cornefield in Sumatra and presented by him to the Society, described by Dr Abel in the Researches. I am not sure whether or not the above trivial name has been given before, but it seems to be the most appropriate

No 122 FAM Lemures
 GEN Lemur
 SP L mongoz (?) Woolly Lemur (')
A Skull

No 123 ORD Rodentia
 GEN Castor
 SP C fiber—The common Beaver
A Skull

No 124 ORD Carnassiers
 FAM Carnivora
 TRIB Digitigrades
 GEN Lutra
 SP L — The — Otter
A Skull

There are at least two Otters in India, a large and a small species

No 125 ORD Cetacei
 126 FAM Cete
 GEN Balæna
 SP B. mysticetus The —
A Skull, Scapula, and thirty-four Vertebra

No 126 One side of a large lower jaw

No 125 Presented by G Swinton, Esq

No 127 ORD Quadrumana
 FAM Simiadæ
 GEN Semnopithecus
 SP S maurus (?) The Negro Monkey (?)

Presented by Mr J T. Pearson, mounted in the Museum

A Skeleton

No • 128 ORD Rodentia
 GEN Mus
 SP M decumanus The Norway Rat
A Skeleton

Presented by Mr J T Pearson.

- No 129 ORD Carnassiers
 FAM Carnivora
 TRIB Digitigrades
 GEN Paradoxurus
 SP P typus (?) common Paradoxurus (')

An articulated Skeleton.

Presented by Mr J T Pearson

I am uncertain as to the species of this animal , in colour, form, and size, it is like the *Viverra musanga* of Horsfield, but the dental system is different

- No 130 GEN. *Felis*
 SP *F catus*.—The Cat

An articulated Skeleton

Presented by Mr J T Pearson

- No 131 ORD Pachydermata
 GEN Hippopotamus
 SP *H amphibius*—The Hippopotamus

An incisor Tooth

- No 132 CL. Reptilia
 133 ORD. Sauria
 134 TRIB Crocodylidae
 GEN. *Crocodilus*
 SP *C. biporcatus*—The Indian Crocodile.

A Skull and lower Jaw

Nos 133 and 134 are of the Skull only

- No 135 CL Aves.
 ORD Gallatores
 FAM Ardeidae
 GEN. *Phœnicopterus*
 SP *P. ruber* The Red Flamingo

The Bill

- No. 136 ORD. Natatores.
 137 FAM. Pelecanidae
 GEN. *Pelecanus*.
 SP *P onocrotalus* The Pelican.

The Skull and upper Mandible, and 137 with lower do

No 138 ORD. Grallatores
 FAM. Ardeidæ
 GEN Mycteria
 SP M Australis The Jahiru
Skull and Mandibles

No 139 ORD Insesores
 TRIBE Scansores
 FAM Ramphastidæ
 GEN Ramphastos
 SP R pectoralis—The Red Breasted Toucan
Skull and Mandibles

No 140 TRIBE Conirostres
 FAM Buceridæ
 GEN Buceros
 SP B. Malabaricus—Pied Hornbill
A Skull

Presented by Lieut. Vicary.

No 141. ORD Grallatores
 FAM Ardeidæ
 GEN Platalea
 SP P leucorodia—The White Spoonbill
A Skull

Presented by Lieut Vicary

No 142. CL Mammalia
 ORD. Rodentia
 GEN Sciuropterus
 SP S. _____ ?

A Skull

Presented by Lieut Vicary

No 143. ORD Ruminantia
 FAM Capridæ.
 GEN. Antelope
 SUB. GEN Tetracerus
 SP A chikara—The Chikara
A Skull and Horns

. Presented by Lieut Vicary

